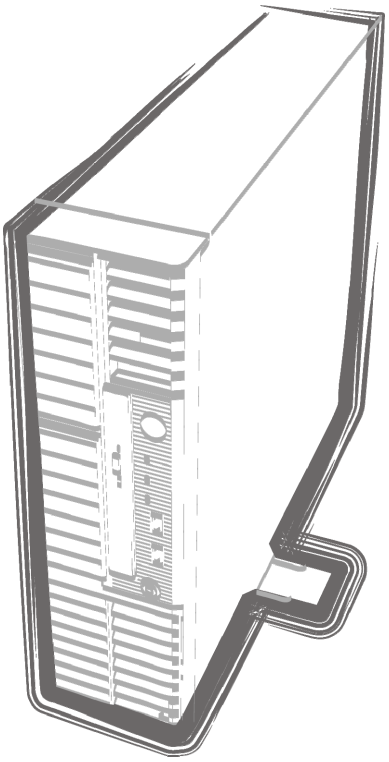
Express5800

NEC



NEC Express Server
Express5800 Series

Express5800/T110f-S
EXP285A
User's Guide

Model Number: N8100-1983F/1984F

Chapter 1 General Description

Chapter 2 Preparations

Chapter 3 Setup

Chapter 4 Appendix

10.101.01-101.01
July 2013, First Edition

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Documents Provided with This Product

Documents for this product are provided as accompanying booklets (📖) and as electronic manuals (PDF) stored within EXPRESSBUILDER DVD (💿).

📖 Precautions for Use	Describes points of caution to ensure the safe use of this server. **Read these cautions before using this server.**
📖 Getting Started	Describes how to use this server, from unpacking to operations. Refer to this guide as you begin for an overview of this server.

💿 EXPRESSBUILDER

PDF User's Guide

Chapter 1: General Description	Overviews, names, and functions of the server's parts
Chapter 2: Preparations	Installation of additional options, connection of peripheral devices, and ideal location for this server
Chapter 3: Setup	System BIOS configurations and summary of EXPRESSBUILDER
Chapter 4: Appendix	Specifications and other information

PDF Installation Guide (Windows)

Chapter 1: Installing Windows	Installation of Windows and drivers, and important information for installation
Chapter 2: Installing the Bundled Software	Installation of bundled software, such as NEC ESMPRO and Universal RAID Utility

PDF Maintenance Guide

Chapter 1: Maintenance	Server maintenance and troubleshooting
Chapter 2: Convenient Features	Useful features and the detail of system BIOS settings, RAID Configuration Utility, and EXPRESSBUILDER
Chapter 3: Appendix	Error messages and Windows Event Logs

PDF Other documents

Provides the detail of NEC ESMPRO, Universal RAID Utility, and the other features.

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Notations Used in this Document

Notations used in the text

In addition to safety-related symbols urging caution, 3 other types of notations are used in this document. These notations have the following meanings.

Important	Indicates critical items that must be followed when handling the server or operating software. If the procedures described are not followed, **server failure, data loss, and other serious malfunctions could occur**.
Note	Indicates items that must be confirmed when handling the server or operating software.
Tips	Indicates information that is helpful to keep in mind when using this server.

Optical disk drives

This server is equipped with one of the following drives, depending on the order at the time of purchase. These drives are referred to as *optical disk drives* in this document.

- **DVD-ROM drive**
- **DVD Super MULTI drive**

Hard disk drives

Unless otherwise stated, the hard disk drives (HDD) described in this document refer to the following.

- **Hard disk drives (HDD)**
- **Solid state drive (SSD)**

Removable media

Unless otherwise stated, removable media described in this document refer to the following.

- **USB memory**
- **Flash FDD**

Abbreviations of Operating Systems

Windows Operating Systems are referred to as follows.

Refer to *Chapter 1* (*1.2 Supported Windows OS)* in *Installation Guide (Windows)* for detailed information.

Notations in this document	Official names of Windows
Windows Server 2012	Widnows Server 2012 Standard
	Widnows Server 2012 Datacenter
	Windows Server 2012 Foundation
Windows Server 2008 R2	Windows Server 2008 R2 Standard
	Windows Server 2008 R2 Enterprise
Windows Server 2008 *	Windows Server 2008 Standard
	Windows Server 2008 Enterprise

* Includes 64-bit and 32-bit Editions unless otherwise stated.
The following appears on EXPRESSBUILDER.

- Windows Server 2008 64-bit Edition: Windows Server 2008 x64
- Windows Server 2008 32-bit Edition: Windows Server 2008 x86

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FCC Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Industry Canada Class A Emission Compliance Statement/ Avis de conformité à la réglementation d'Industrie Canada:

CAN ICES-3(A)/NMB-3(A)

CE / Australia and New Zealand Statement

This is a Class A product. In domestic environment this product may cause radio interference in which case the user may be required to take adequate measures (EN55022).

BSMI Statement

警告使用者：

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

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In the European Union

EU-wide legislation as implemented in each Member State requires that used electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes Information and Communication Technology (ICT) equipment or electrical accessories, such as cables or DVDs.

When disposing of used products, you should comply with applicable legislation or agreements you may have. The mark on the electrical and electronic products only applies to the current European Union Member States.

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If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority and ask for the correct method of disposal.

Turkish RoHS information relevant for Turkish market

EEE Yönetmeliğine Uygundur

CCC声明

声　明

此为A级产品，在生活环境中，该产品可能会造成无线电干扰。在这种情况下，可能需要用户对其干扰采取切实可行的措施。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷线路板	×	○	○	○	○	○
HDD、DVD等	×	○	○	○	○	○
机箱、支架	○	○	○	○	○	○
电源	×	○	○	○	○	○
键盘	×	○	○	○	○	○
其他（电缆、鼠标等）	×	○	○	○	○	○

○：表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/T11363-2006标准规定的限量要求以下。
×：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T11363-2006标准规定的限量要求。

Vietnam RoHS information relevant for Vietnam market

Complying with "CIRCULAR, No.30/2011/TT-BCT (Hanoi, August 10 2011), Temporary regulations on content limit for certain hazardous substances in electrical products"

警告:
如果更換錯誤池會產生爆炸請以相同或同型電池更換使用

Declaration of Conformity
with the requirements of Technical Regulation on the Restriction Of the use of certain Hazardous Substances in Electrical and Electronic Equipment
(adopted by Order №1057 of Cabinet of Ministers of Ukraine)

The Product is in conformity with the requirements of Technical Regulation on the Restriction Of the use of certain Hazardous Substances in electrical and electronic equipment (TR on RoHS).

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2. Cadmium (Cd) – not over 0,01wt % or 100wt ppm;
3. Mercury (Hg) – not over 0,1wt % or 1000wt ppm;
4. Hexavalent chromium (Cr6+) – not over 0,1wt % or 1000wt ppm;
5. Polybrominated biphenyls (PBBs) – not over 0,1wt % or 1000wt ppm;
6. Polybrominated diphenyl ethers (PBDEs) – not over 0,1wt % or 1000wt ppm.

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(затвердженого Постановою №1057 Кабінету Міністрів України)

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2. кадм*ій* (Cd) – не перевищує 0,0*1 %* ваги речовини або в концентрації до 100 частин на мільйон;
3. ртуть (Hg) – не перевищує 0*,1 %* ваги речовини або в концентрації до 1000 частин на мільйон;
4. шестивалентний хром (Cr6+) – не перевищує 0*,1 %* ваги речовини або в концентрації до 1000 частин на мільйон;
5. полібромбіфеноли (PBB) – не перевищує 0*,1%* ваги речовини або в концентрації до 1000 частин на мільйон;
6. полібромдефенілові ефіри (PBDE) – не перевищує 0*,1 %* ваги речовини або в концентрації до 1000 частин на мільйон.

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(утверждённого Постановлением №1057 Кабинета Министров Украины)

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2. кадмий (Cd) – не превышает 0,01 % веса вещества или в концентрации до 100 миллионных частей;
3. ртуть (Hg) – не превышает 0,1 % веса вещества или в концентрации до 1000 миллионных частей;
4. шестивалентный хром (Cr6+) – не превышает 0,1 % веса вещества или в концентрации до 1000 миллионных частей;
5. полибромбифенолы (PBB) – не превышает 0,1 % веса вещества или в концентрации до 1000 миллионных частей;
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The most recent version of User's Guide, as well as other related documents, is also available for download from the following website.

http://www.nec.com/

Precautions for Use (Be Sure to Read)

The following provides information required to use your server safely and properly. For details of names in this section, refer to *Names and Functions of Parts* in this document.

Safety precautions

Follow the instructions in this document for the safe use of the NEC Express server.
This User's Guide describes hazardous parts of the server, possible hazards, and how to avoid them. Server components with possible danger are indicated with a warning label placed on or around them (or, in some cases, by printing the warnings on the server).
In User's Guide or on warning labels, **WARNING** or **CAUTION** is used to indicate a degree of danger. These terms are defined as follows:

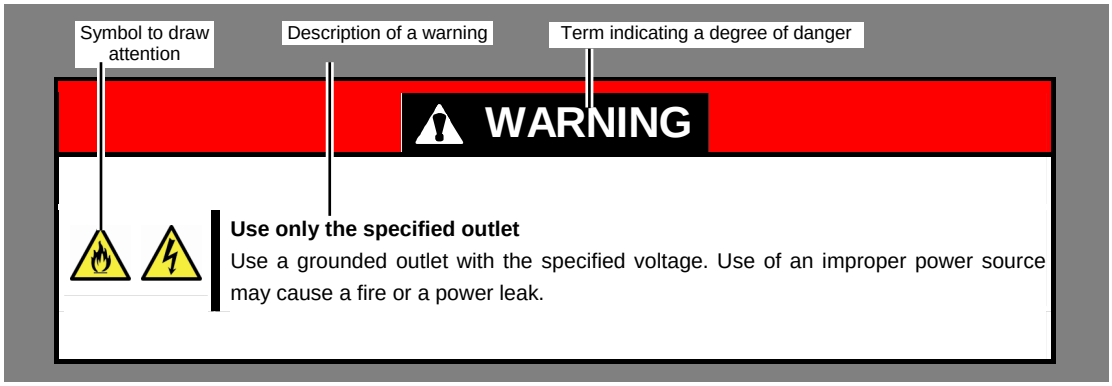
WARNING Indicates there is a risk of death or serious personal injury

CAUTION Indicates there is a risk of burns, other personal injury, or property damage

Precautions and notices against hazards are presented with one of the following three symbols. The individual symbols are defined as follows:

	Attention	This symbol indicates the presence of a hazard if the instruction is ignored. An image in the symbol illustrates the hazard type.	(Example) (Electric shock risk)
	Prohibited Action	This symbol indicates prohibited actions. An image in the symbol illustrates a particular prohibited action.	(Example) (Do not disassemble)
	Mandatory Action	This symbol indicates mandatory actions. An image in the symbol illustrates a mandatory action to avoid a particular hazard.	(Example) (Disconnect a plug)

(A label example used in this User's Guide)


Symbol to draw attention
Description of a warning
Term indicating a degree of danger
WARNING
Use only the specified outlet
Use a grounded outlet with the specified voltage. Use of an improper power source may cause a fire or a power leak.

Symbols used in this document and on warning labels

Attentions

	Indicates the presence of electric shock hazards.		Indicates the presence of mechanical parts that can result in bodily injury.
	Indicates the presence of a hot surface or component. Touching this surface could result in bodily injury.		Indicates the presence of mechanical parts that can result in pinching or other bodily injury.
	Indicates there is a risk of explosion.		Indicates the presence of laser beam that cause blindness.
	Indicates there is a risk of fire or fumes.		Indicates a general notice or warning that cannot be specifically identified.

Prohibited Actions

	Do not disassemble, repair, or modify the server. Otherwise, an electric shock or fire may be caused.		Do not touch the server with wet hand. Otherwise, an electric shock may be caused.
	Do not touch the component specified by this symbol. Otherwise, an electric shock or burn may be caused.		Do not use the server in the place where water or liquid may pour. Otherwise, an electric shock or fire may be caused.
	Do not place the server near the fire. Otherwise, a fire may be caused.		Indicates a general prohibited action that cannot be specifically identified.

Mandatory Actions

	Unplug the power cord of the server. Otherwise, an electric shock or fire may be caused.		Indicates a mandatory action that cannot be specifically identified. Make sure to follow the instruction.
	Make sure equipment is properly grounded. Otherwise, an electric shock or fire may be caused.		

Safety notes

This section provides notes on using the server safely. Read this section carefully to ensure proper and safe use of the server. For symbols, refer to *Safety precautions*.

General

WARNING

Do not use the server for services where human life may be at stake or high reliability is required.

This server is not intended for use in medical, nuclear, aerospace, mass transit or other applications where human life may be at stake or high reliability is required, nor is it intended for use in controlling such applications. We disclaim liability for any personal injury and property damages caused by such use of this server.

Do not use the server if any smoke, odor, or noise is present.

If smoke, odor, or noise is present, immediately turn off the server and disconnect the power plug from the outlet, then contact the store where you purchased the product or your maintenance service company. Using the server in such conditions may cause a fire.

Do not insert needles or metal objects.

Do not insert needles or metal objects into ventilation holes in the server or openings in the optical disk drive. Doing so may cause an electric shock.

CAUTION

Keep water or foreign matter away from the server.

Do not let any liquid such as water or foreign materials including pins or paper clips enter the server. Failure to follow this warning may cause an electric shock, a fire, or failure of the server. When such things accidentally enter the server, immediately turn off the power and disconnect the power plug from the outlet. Do not disassemble the server, and contact the store where you purchased the product or your maintenance service company.

Power supply and power cord use

WARNING

Do not hold the power plug with a wet hand.

Do not disconnect/connect the plug while your hands are wet. Failure to follow this warning may cause an electric shock.

Do not connect the ground wire to a gas pipe.

Never connect the ground wire to a gas pipe. Failure to follow this warning may cause a gas explosion.

CAUTION

Plug in to a proper power source.

Use a grounded outlet and observe the specified voltage. Use of an improper power source may cause a fire or a power leak.

Do not install the server where you need an extension cord. Use of a cord that does not meet the power specifications of the server may heat up the cord and cause a fire.

If you want to use an AC cord set with a ground wire of class OI, be sure to connect the ground wire before inserting the power plug into the outlet. Before disconnecting the ground wire, be sure to disconnect the power plug from the output.

Do not connect many cords into a single outlet by using extension cords.

The electric current exceeding the rated flow overheats the outlet, which may cause a fire.

Do not pull out a cable by gripping the cable part.

Pull a cable straight out by gripping the connector part. Pulling a cable by gripping the cable part or applying extra pressure to the connector part may damage the cable part, which may cause a fire or electric shock.

Insert the power plug into the outlet as far as it goes.

Heat generation resulting from a halfway inserted power plug (imperfect contact) may cause a fire. Heat will also be generated if condensation is formed on dusty blades of the halfway inserted plug, increasing the possibility of fire.

CAUTION

Do not use any unauthorized interface cable.

Use only the interface cables provided with the server. Electric current that exceeds the amount allowed could cause fire.

Also, observe the following precautions to prevent electrical shock or fire caused by a damaged power cord.

- Do not stretch the cord harness
- Do not bend the power cord.
- Do not twist the power cord
- Do not step on the power cord.
- Uncoil the power cord before use
- Do not secure the power cord with staples or equivalents
- Do not pinch the power cord
- Keep chemicals away from the power cord
- Do not place any object on the power cord
- Do not alter, modify, or repair the power cord
- Do not use a damaged power cord (replace the damaged power cord with a power cord of the same standard. For information on replacing the power cord, contact the store where you purchased the product or a maintenance service company)

Do not use the attached power cord for any other devices or usage.

The power cord that comes with your server is designed aiming to connect with this server and to use with the server, and its safety has been tested. Do not use the attached power cord for any other purpose. Doing so may cause a fire or an electric shock.

Installation, relocation, storage, and connection

CAUTION

Do not attempt to lift the server by holding the front bezel.

Securely hold the server by the base to move or lift. Do not attempt to lift it by holding the front bezel. Doing so may cause the front bezel to come off, which may cause not only breakage of the server but also cause the server to fall on to persons resulting in personal injury.

Do not install the server in any place other than specified.

Do not install the server in the following places or any place other than specified in this User's Guide. Failure to follow this instruction may cause a fire.

- A dusty place
- A humid place such as near a boiler
- A place exposed to direct sunlight
- An unstable place

Do not use the server in an environment where corrosive gas is present

Do not install the server in a place subject to corrosive gases including sodium chloride, sulfur dioxide, hydrogen sulfide, nitrogen dioxide, chlorine, ammonia, or ozone. Do not install the server in an environment that contains dust, chemicals that accelerate corrosion such as NaCl or sulfur, or conductive materials. Failure to follow this warning may cause the wiring on the printed wiring board to short-circuit, leading to fire. If you have any questions, contact the store where you purchased the product or a maintenance service company.

Do not connect or disconnect any interface cable with the power cord of the server plugged to a power source.

Be sure to power off the server and unplug the power cord from a power outlet before installing/removing any optional internal device or connecting/disconnecting any interface cable to/from the server. If the server is off-powered but its power cord is plugged to a power source, touching an internal device, cable, or connector may cause an electric shock or a fire resulted from a short circuit.

Use only the specified interface cable.

Use only interface cables provided by NEC and locate a proper device and connector before connecting a cable. Using an authorized cable or connecting a cable to an improper destination may cause a short circuit, resulting in a fire.

Also, observe the following notes on using and connecting an interface cable.

- Do not use any damaged cable connector.
- Do not step on the cable.
- Do not place any object on the cable.
- Do not use the server with loose cable connections.
- Do not use any damaged cable.

Cleaning and working with internal devices

WARNING

Do not disassemble, repair, or alter the server.

Never attempt to disassemble, repair, or alter the server on any occasion except as described in this document. Failure to follow this warning may cause not only malfunction of the server but also an electric shock or fire.

Do not look into the optical disk drive

A laser beam used in the optical disk is harmful to the eyes. Do not look into or insert a mirror into the drive while the drive is powered on. If a laser beam (which is invisible) enters your eyes, you may lose your eyesight.

Do not attempt to remove lithium, NiMH, or Li-ion batteries.

The server contains the lithium, NiMH, or Li-ion battery (some optional devices have a lithium, NiMH, or Li-ion battery installed). Do not remove the battery. Placing a battery close to a fire or in the water may cause an explosion.

When the server does not operate appropriately due to the dead battery, contact the store you purchased the product or your maintenance service company. Do not attempt to disassemble the server to replace or recharge the battery by yourself.

CAUTION

High temperature

Components including internal Hard Disk Drives in the server are extremely hot just after the server is turned off. Allow the surface to cool before installing/removing.

Secure cables or cards in place

Be sure to secure the power cord, interface cables, and cards in place. Incomplete installation causes a loose connection, resulting in smoke or fire

During operation

CAUTION

Avoid contact with the server during thunderstorms.

Do not touch any part of the server including the cables when a thunderstorm is approaching. Also, do not connect or disconnect any devices. There may be a risk of electric shock from lightning strike.

Keep animals away from the server.

Keep animals such as pets away from the server. Pet hair or other waste enters the server, which may cause a fire or electric shock.

Do not place any object on top of vertically mounted servers.

Any weight on the server may cause the server to fall, resulting in personal injury or property damage.

Do not place any object that weighs 5 kg or more on top of horizontally mounted servers.

The maximum weight that can be placed on top of the server when it is horizontally mounted is 5 kg. Do not place any object weighing 5 kg or more on top of the server. Failure to observe this limit may deform the server, which could cause a failure.

Do not leave the optical disk drive tray open.

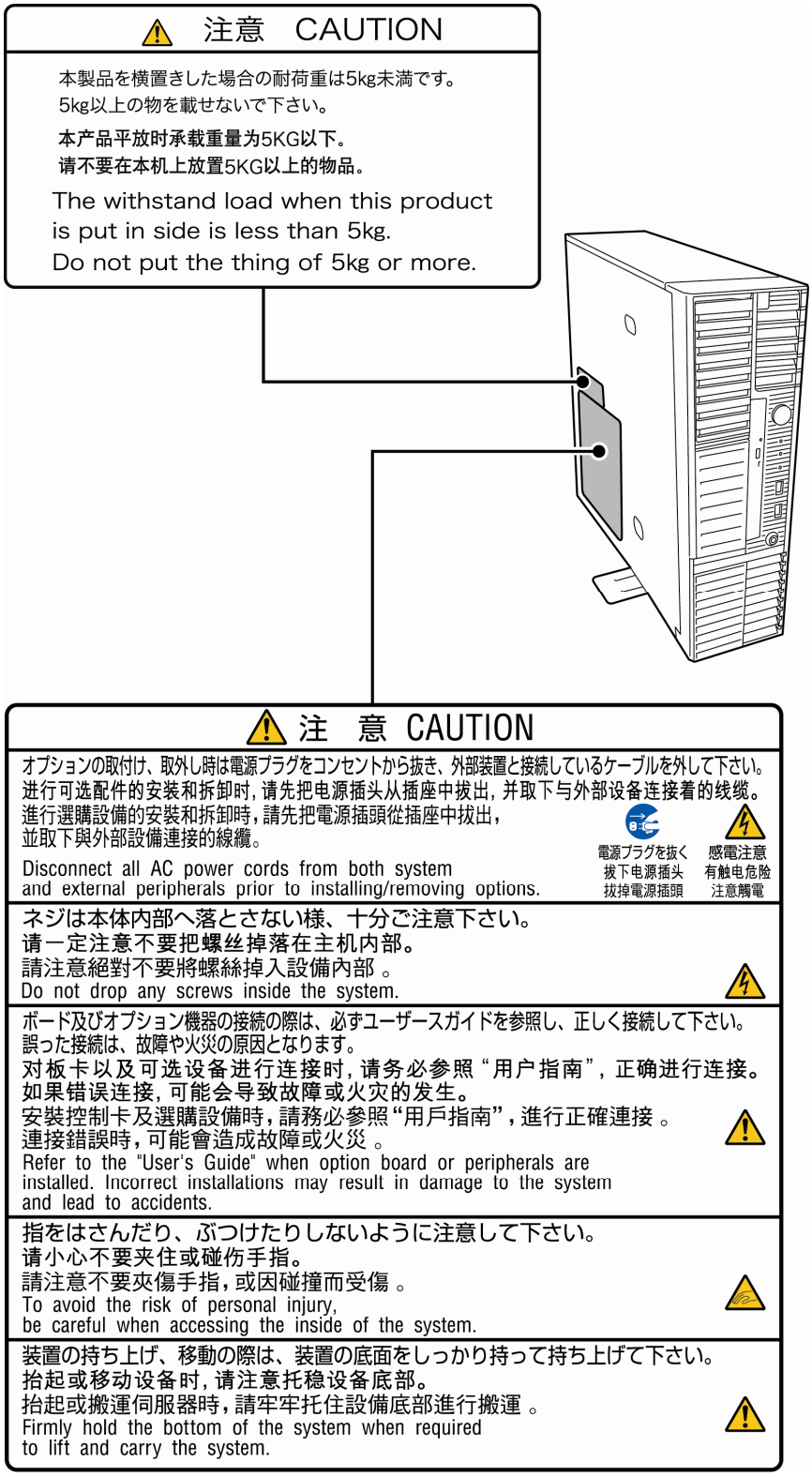
Dust may get in the server when the tray is open, which may result in a malfunction. In addition, bumping the open tray could cause personal injury.

Do not get yourself caught in the fan

Keep your hands and hair away from the cooling fan at the rear of the server during operation. Failure to observe this warning may cause your hands or hair to catch in the fan, resulting in personal injury.

Warning labels

Warning label are attached on or near the components with potential hazards (This label is either attached or printed on the component.) to draw attention from users to potential hazards involved in handling the server. (Do not remove or black out this label and keep it clean). If no label is attached or printed on the server, or if there is a label coming off or stained, contact the store where you purchased the product.



Handling precautions (for proper operations)

Be sure to observe the following precautions for the proper functioning of the server. Ignoring the precautions may cause server malfunction or failure.

- Do not use any cell phone or PHS and switch off them near the server. Electric waves from such devices can cause server to malfunction.
- Install the server in an appropriate place. For details about the installation location, refer to *Chapter 2 Preparations (2. Installation and Connection)*.
- Before connecting/removing cables to/from peripheral devices, make sure that the server is off and unplug the power cord, if they are non plug-and-play devices.
- Connect the provided power cord to a 100 VAC outlet. If an optional cable is used, you may connect to a 100 or 200 VAC power system.
- Make sure that the access LED on the server is off before turning off the power or ejecting an optical disk.
- Wait for at least 30 seconds before turning on the server after turning off the server. If any Uninterruptible Power Supply unit is connected, set it to wait for at least 30 seconds before turning on the server after power off. If the optional RAID Controller N8103-167 is installed, wait for at least 90 seconds before turning on the server after turning off the power.
- Turn off the server and unplug the power cord before moving it.
- Regularly clean the server to prevent various types of failure. (Refer to *Chapter 1 Maintenance (2. Daily Maintenance)* in "*Maintenance Guide*" for details about cleaning.)
- Momentary voltage drop may occur due to lightning strike. To prevent this, use of UPS is recommended.
- We do not guarantee that any copy-protected CD that does not conform to standards will play on the CD player.
- In the following cases, check and adjust the system clock before operation.
  - After transportation
  - After storage
  - After the server is used following a period of disuse, in which storage conditions did not conform to those that guarantee server operations (temperature: 10°C to 40°C; humidity: 20% to 80%).
- Check the system clock approximately once per month. Use of a time server (NTP server) is recommended if high accuracy timing is required by the system.
  If you notice that the system clock runs significantly faster or slower over time even after adjustment, contact the store where you purchased the product or your maintenance service company for repair.
- In order to get the server and internal devices to work properly, we recommend you store the server at room temperature.
  Observe the storage conditions (Temperature: −10°C to 55°C, Humidity: 20% to 80%) to store the server. (No condensation of moisture)

- If this server, internal optional devices, and media set for the backup devices (tape cartridges) are moved from a cold place to a warm place in a short time, condensation will occur and cause malfunctions and failures when these are used in such state. To protect important stored data and property, make sure to wait for a sufficient period to use the server and components in the operating environment.
  Reference: Time effective at avoiding condensation in winter (10°C or more differences between the room temperature and atmospheric temperature)
  - Disk devices: Approximately 2 to 3 hours
  - Tape media: Approximately 1 day
- For optional devices, we recommend you use our NEC products. Some memory or Hard Disk Drive manufactured by other companies are supported for use with this server, however, you will be charged to repair failure or damage caused by use of such products even within warranty period.

Anti-Static Measures

This product contains static-sensitive electronic components. Follow the measures below to avoid a failure caused by static electricity when installing or uninstalling any optional device.

- **Wearing Anti-static Wrist Strap or Anti-static Gloves**
  Wear a wrist strap on your wrist and connect the wire to the chassis. If there is no wrist strap, touch an unpainted metal surface of the chassis connected to the ground to discharge static electricity from your body before touching the component. Touch the metal part occasionally to discharge the static electricity while working on the component.

- **Checking the Workplace**
  - Work on an anti-static floor or concrete floor.
  - If you work on a place where static electricity is likely to be generated (e.g. carpet), be sure to provide anti-static protection.

- **Using the Work Table**
  Place the server on a mat with Electrostatic Discharge (ESD) protection.

- **Clothing**
  - Do not wear wool or synthetic clothes.
  - Wear anti-static shoes.
  - Remove any kind of metal accessories such as a ring, bracelet or wrist watch.

- **Handling of Components**
  - Keep the component in an anti-static bag until you install it to the server.
  - Hold the component by the edges to avoid touching any terminals or mounting parts.
  - Place the component in an anti-static bag when storing or moving them.

- **Handling of Cables**
  When connecting a cable (e.g., LAN cable), static electricity may also be charged due to friction against the floor.
  Connecting the charged cable with an I/O device may cause damage to the devices in the system. It is recommended to use a product such as electrostatic discharge kit to eliminate the static charge before connecting the cable.

- **Installing and Uninstalling the Optional Device**
  - To avoid electric hazard and malfunction, be sure to turn off the power switch of the server and unplug the power cord from the outlet before installing or uninstalling any optional device. If the device is hot-swappable, you do not need to turn off the power switch and unplug the power cord.
  - The device contains static-sensitive electronic components. When installing or uninstalling the optional device, wear an anti-static wrist strap on your wrist to avoid a failure caused by the static electricity. To use the strap, connect the wire to the chassis.

Tips for your health and safety

Using a computer extensively may affect different parts of your body. Here are tips you should follow while working on a computer to minimize strain on your body.

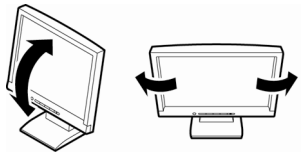
Keep proper posture

The basic body position for using a computer is sitting straight with your hands on the keyboard parallel with the floor, and your eyes directed slightly downward toward the monitor. With the proper posture described above, no unnecessary strain is applied on any part of your body, in other words when your muscles are most relaxed.

Working on the computer with bad posture such as hunching over or being too close to the monitor could cause fatigue or deteriorated eyesight.

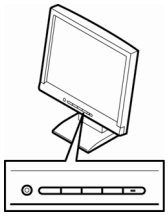
Adjust the angle of your display

Most display units are designed for adjustment of the horizontal and vertical angles. This adjustment is important to prevent the screen from reflecting bright lights and to make the display contents easy to see. Working without adjusting the display to a comfortable angle makes it difficult for you to maintain a proper posture and you will get tired easily. Adjust the viewing angle before use.



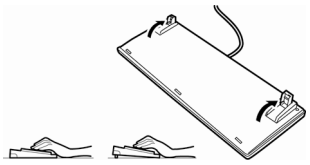
Adjust the brightness and contrast of the display

Display screens have functions to control brightness and contrast. The most suitable brightness/contrast depends on age, individuals, and environment, so adjust it to suit your preferences. A too bright or too dark display is bad for your eyes.



Adjust the angle of keyboard

Some keyboards are ergonomically designed, which allow the angle to be adjusted. Adjusting the angle of the keyboard is effective to reduce tension on your shoulders, arms, and fingers.



Clean your equipment

Keeping your equipment clean is important not only for the appearance but also for functional and safety reasons. A dusty monitor makes it difficult to see the display contents, so clean it regularly.

Take rest breaks

When you feel tired, take a break. Light exercise is also recommended.

NEC Express5800 Series
Express5800/T110f-S

1

General Description

This chapter introduces the features of this server and the name of each part.

1. **Introduction**

2. **Accessories**
   Verify the condition of your server's accessories.

3. **Standard Features**
   Check and maintain the server system by using the functions explained in this section.

4. **Names and Functions of Parts**
   This section describes the name of each part contained in this server.

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1. Introduction

Thank you for purchasing this NEC Express5800 Series product.
This high performance server is powered by the latest Intel® processor "Intel® Xeon® processor".

NEC's latest technology and architectures realize high-power and high-speed operation that cannot be matched by existing servers.
The server is designed with consideration of not only reliability but also expandability, which enables you to use it as a network server.
Read this document before using the server thoroughly to fully understand handling of the NEC Express server and appreciate its functions to the maximum extent.

2. Accessories

The carton box contains various accessories which are required for setup or maintenance. **Make sure you have them all** for future use.

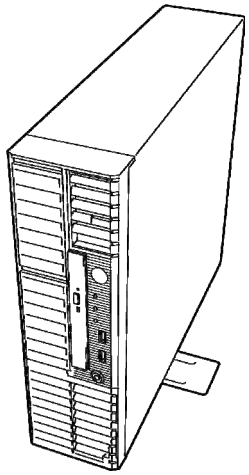
- Keyboard × 1
- Mouse × 1
- Rubber foot × 4
- Bezel lock key × 2*1
- Screw set (502) × 1
- EXPRESSBUILDER DVD*2 × 1
- Getting Started × 1
- Power cord × 1
- SDR update CD-ROM × 1

*1 Only when 2.5-inch HDD cage is installed.
*2 Documents are stored in EXPRESSBUILDER. Adobe Reader is required to read the documents so make sure you have it installed in your PC.

Make sure you have all accessories and inspect them. If an accessory is missing or damaged, contact your sales representative.

3. Standard Features

The server has the following standard features:



High performance
- Intel® Xeon® processor
- High-speed memory access (DDR3 1600 supported)
- High-speed disk access (SATA2 6 Gbps, SAS 6 Gbps supported) *2
- High-speed 1000BASE-T (2 ports) interface
  (1 Gbps/100 Mbps/10 Mbps supported)

High reliability
- Memory monitoring feature (error correction/error detection)
- Memory degeneracy feature (logical isolation of a failed device)
- Bus parity error detection
- Temperature detection
- Error detection
- Internal fan monitoring feature
- Internal voltage monitoring feature
- RAID System (Disk Array) (also available as an option)
- BIOS password feature

Management utilities
- NEC ESMPRO
- ExpressUpdate
- Remote controlling feature (EXPRESSSCOPE Engine 3)
- RAID System management utility (Universal RAID Utility)
- Hard disk drive monitoring

Power saving and noiseless design
- Power monitoring feature
- Power control feature
- High-efficiency power supply supporting 80 PLUS® Platinum
- Fan control appropriate to environment, work load, and configuration
- Enhanced Intel SpeedStep® Technology supported

Expandability
- Many IO option slots
  - PCI Express 3.0 (x 16 lanes) : 1 slot (low profile)
  - PCI Express 2.0 (x 4 lanes): 1 slot (low profile)
  - PCI Express 2.0 (x 1 lanes): 2 slots (low profile)
- Large memory of up to 32 GB
- Backup device bay provided as standard
- USB 3.0 interface (Only when the OS and USB ports support this interface)
- Three LAN connectors (one for management LAN)

Ready to use
- Hard disk drives can be installed with one-touch setup, which requires no cables (hot swap supported)

Many built-in features

- El Torito Bootable CD-ROM (no emulation mode) format supported
- Software power-off
- Remote power-on feature
- AC-Link feature
- Remote console feature
- Baseboard Management Controller (BMC) conforming to IPMI v2.0

Self-diagnosis

- Power On Self-Test (POST)
- Test and Diagnosis (T&D) utility

Easy setup

- EXPRESSBUILDER (setup utility)
- SETUP (BIOS SETUP utility)

Maintenance features

- Off-line tool
- Memory dump feature using the DUMP switch
- Feature to back up and restore BIOS/BMC settings using the EXPRESSSCOPE profile key

3.1 Management Features

The hardware components of the server provide operation control/reliability features as shown below. Additionally, *NEC ESMPRO Agent*, which is provided in EXPRESSBUILDER, enables you to collectively manage the state of your systems. You can also monitor the server states from a PC to manage the network where NEC ESMPRO Manager provided in EXPRESSBUILDER is installed.

The features available on this server are as shown in the table below.

Function		Availability	Description
Hardware			Shows physical hardware information.
	Memory bank	○	Shows physical memory information.
	Device info	○	Shows information specific to the server.
	CPU	○	Shows physical CPU information.
System		○	Shows logical CPU information and monitors the load factor. Shows logical memory information and monitors the status.
I/O device		○	Shows information on I/O devices (serial ports, keyboard, mouse, and video).
System environment			
	Temperature	○	Monitors the temperature inside of the chassis.
	Fan	○	Monitors the fans.
	Voltage	○	Monitors the voltage inside of the chassis.
	Power supply	○	Monitors the power supply unit.
	Door	×	Monitors chassis intrusion (open/close of the covers and doors on the chassis).
Software		○	Shows service, driver, and OS information.
Network		○	Shows network (LAN) information and monitors packets.
BIOS		○	Shows BIOS information.
Local polling		○	Monitors the values of an MIB item obtained by NEC ESMPRO Agent.
Storage		○	Monitors controllers and storage devices including hard disk drives.
File system		○	Shows the file system configuration and monitors the free space.
RAID System		○	Monitors the following RAID Controllers: • On-board RAID Controller (LSI Embedded MegaRAID™) • Optional RAID Controller
Others*		○	Monitors OS stall using the Watch Dog Timer.
		○	Performs alert processing after an OS STOP error occurs.

○: Supported. △: Partially supported. ×: Unsupported.

*: Not displayed on the NEC ESMPRO Manager screen.

Tips NEC ESMPRO Manager and NEC ESMPRO Agent are supplied with the server as standard. For how to install and use each software component, refer to the explanation of the component.

3.2 Firmware and Software Version Management

By using NEC ESMPRO Manager and ExpressUpdate Agent, you can manage firmware or software on the server and update them by applying an update package.

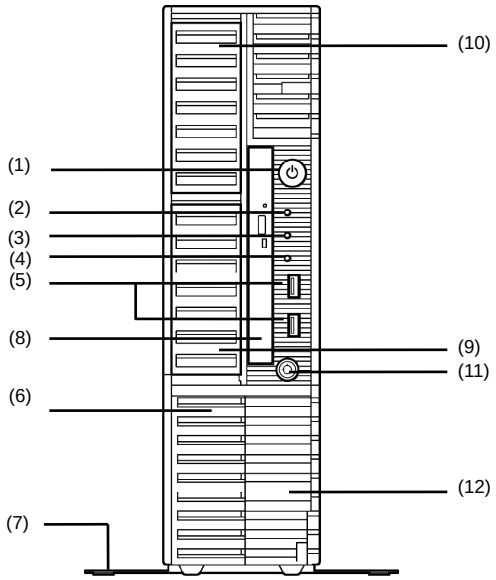
This function automatically updates multiple modules without stopping the system just by specifying the application of an update package from NEC ESMPRO Manager.

4. Names and Functions of Parts

Names and functions of parts are as follows.

4.1 Front of the server

Air Cooling model



(1) POWER Switch
The switch to turn the server on and off. Press once to turn on the server. The LED lights green when it is on. Press it again to turn off the server. Hold down the switch for 4 seconds or more to forcibly turn off the server.

(3) POWER LED (green/amber)
After the power cord is connected, this LED lights amber during initialization of system. This LED lights green when the power is ON.

(3) Disk Access LED (green/amber)
This LED lights or flashes green when the internal hard disk drive or optical disk drive is being accessed.
The LED lights amber if a hard disk drive error occurs. (In RAID System configurations except for an onboard RAID configuration using 3.5-inch hard disk drives.)

(4) STATUS LED (green/amber)
This LED indicates the server status. It lights green when the server is operating normally.

(5) USB connectors (front)
These connectors are used to connect devices that support the USB interface.

Blue connector: for USB 3.0
Black connector: for USB 2.0

(6) Front Bezel
This cover protects the front part of the server.

(7) Stabilizer
To mount the server vertically, install as shown in the image

(8) Optical disk drive
Either of the following drives can be installed.
– DVD-ROM drive
– DVD SuperMULTI drive
Reads data from (or writes data to) the disk.
The drive provides the following: an eject button to eject the tray; an LED that indicates hard disk drive access; and an eject hole for forcibly ejecting the tray

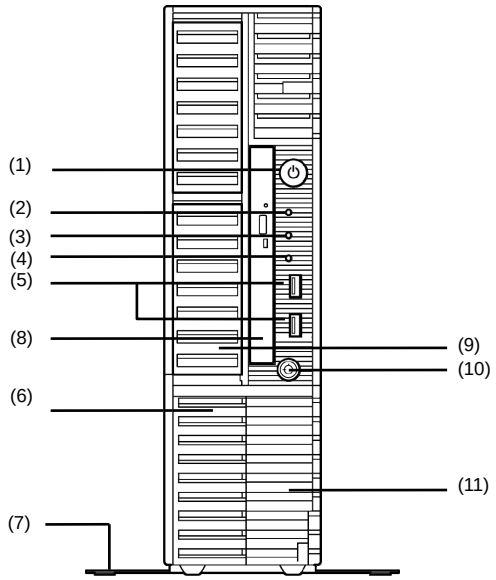
(9) 3.5-inch Expansion Bay 1
The bay which can accommodate 2.5-inch HDD cage (N8154-56F)

(10) 3.5-inch Expansion Bay 2
The bay which can accommodate 3.5-inch backup device.

(11) Key slot
Used for inserting a key to lock the front door (only when a 2.5-inch HDD cage is installed).

(12) Front Door
Open this door when handling the 2.5-inch hard disk drive. This door can be locked by using the bezel lock key.

Liquid Cooling model



(1) POWER Switch
The switch to turn the server on and off. Press once to turn on the server. The Power LED lights green when it is on. Press it again to turn off the server. Hold down the switch for 4 seconds or more to forcibly turn off, the server.

(2) POWER LED (green/amber)
After the power cord is connected, this LED lights green during initialization of system.
This LED lights green when the power is ON.

(3) Disk Access LED (green/amber)
This LED lights or flashes green when the internal hard disk drive or optical disk drive is being accessed.
The LED lights amber if a hard disk drive error occurs. (In RAID System configurations except for an onboard RAID configuration using 3.5-inch hard disk drives.)

(4) STATUS LED (green/amber)
This LED indicates the server status. It lights green when the server is operating normally and lights or flashes amber when errors occur.

(5) USB connectors (front)
These connectors are used to connect devices that support the USB interface.

Blue connector: for USB 3.0
Black connector: for USB 2.0

(6) Front Bezel
This cover protects the front part of the server.

(7) Stabilizer
To mount the server vertically, install as shown in the image

(8) Optical disk drive
Either of the following drives can be installed.
– DVD-ROM drive
– DVD SuperMULTI drive
The drive provides the following: an eject button to eject the tray; an LED that indicates hard disk drive access; and an eject hole for forcibly ejecting the tray.

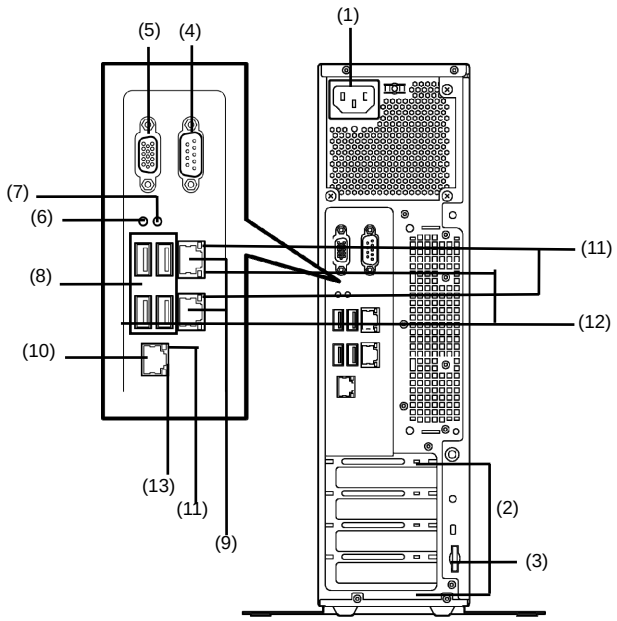
(9) 3.5-inch Expansion Bay
The bay which can accommodate 3.5-inch device or extra HDD cage.

(10) Key slot
Used for inserting a key to lock the front door (only when a 2.5-inch HDD cage is installed).

(11) Front Door
Open this door to handle the 2.5-inch hard disk drives. This door can be locked by using the Bezel lock key.

4.2 Rear view

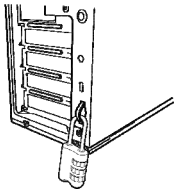
Air Cooling model, liquid Cooling model



(1) AC Inlet
This socket is used to connect the power cord.

(2) PCI slots

(3) Chassis Lock Tab
The lock is provided to protect internal components from theft.



(4) Serial port (COM A) connector
This connector is used to connect devices that support a serial interface. Note that it is not possible to directly connect to a dedicated line. If the N8117-01A additional RS232C connector kit (available as an option), is connected, the connector at N8117-01A will be the serial port B connector.

(5) Display connector
The connector to connect a display

(6) DUMP Switch
Press this switch to obtain a memory dump.

(7) BMC RESET Switch
The switch to reset BMC of this server. Use the switch only when there is something wrong with EXPRESSSCOPE Engine 3 (BMC).

(8) USB connectors
These connectors are used to connect devices that support the USB interface.
Blue connector: for USB 3.0
Black connector: for USB 2.0

(9) LAN connectors
Supports 1000BASE-T interface.
If Shared BMC LAN feature is enabled in ROM Utility, LAN connector 1 can also be used as the management LAN connector. However, sharing port is not recommended from the point of performance and security, because LAN connector 1 may receive both data.

(10) Management LAN connector
A LAN connector which supports 100BASE-TX. This port is used for connection with EXPRESSSCOPE Engine 3, and cannot be used as a data transmission port. This port cannot be used when Shared BMC LAN feature is used.

(11) LINK/ACT LED (green)
The LED indicates the access status of LAN

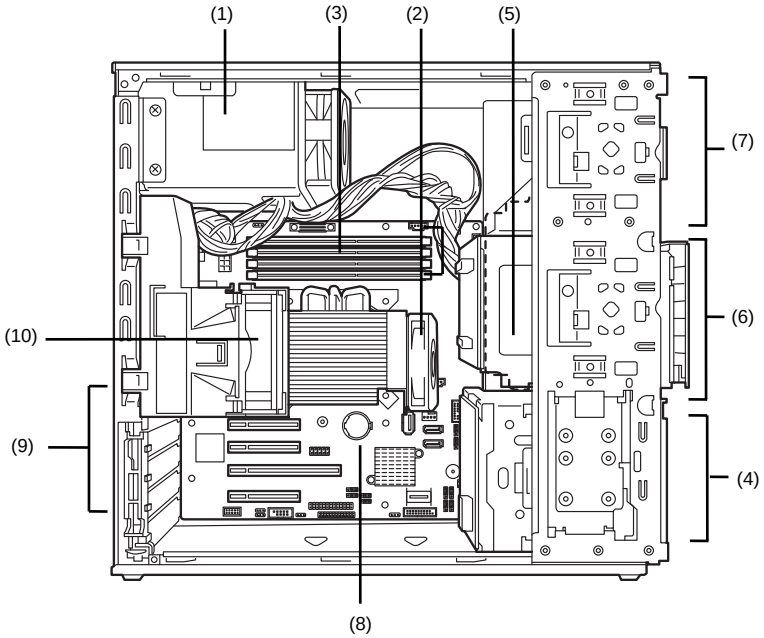
(12) SPEED LED (green/amber)
The LED indicates the transfer speed of LAN ports

(13) SPEED LED (green)
The LED indicates the transfer speed of the LAN port used for management

Important **If you press DUMP Switch, the server will stop.**

4.3 Internal view

<Air Cooling model>



(1) Power supply unit

(2) Cooling fan (CPU)

(3) DIMM slots

(4) Hard Disk Drive Bay

Can be equipped with 3.5-inch or 2.5-inch hard disk drives. (The figure shows the view when 2.5-inch hard disk drives are installed.)

(5) Optical disk drive

(6) 3.5-inch Expansion Bay 1

A bay that can accommodate an extra 2.5-inch HDD cage (N8154-56F)

(7) 3.5-inch Expansion Bay 2

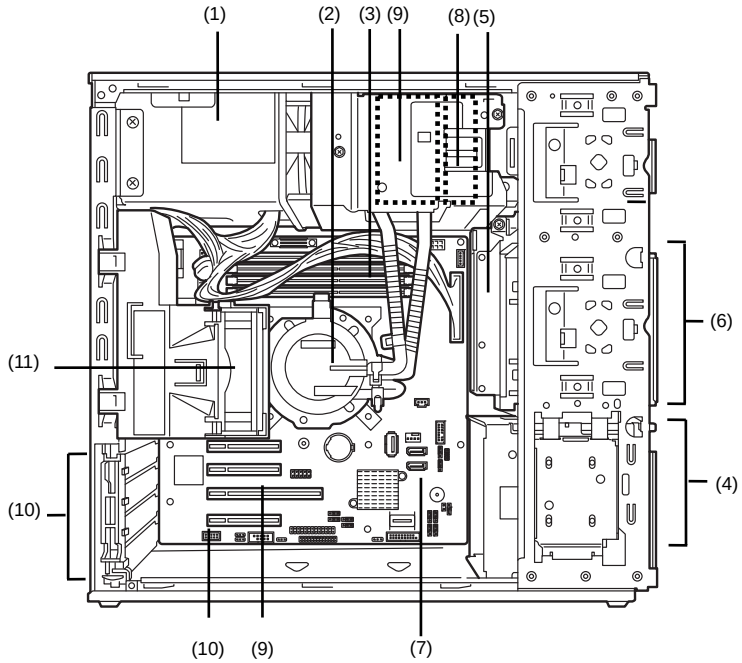
A bay that can accommodate a 3.5-inch backup device

(8) Motherboard

(9) PCI slot

(10) Cooling fan (rear)

<Liquid Cooling model>



(1) Power supply unit

(2) Liquid cooling unit (for cooling CPU)

(3) DIMM slots

(4) Hard disk drive bay

Can be equipped with 3.5-inch or 2.5-inch hard disk drives. (The figure shows the view when 2.5-inch hard disk drives are installed.)

(5) Optical disk drive

(6) 3.5-inch Expansion Bay 1

A bay that can accommodate a 3.5-inch device or an extra 2.5-inch HDD cage

(7) Motherboard

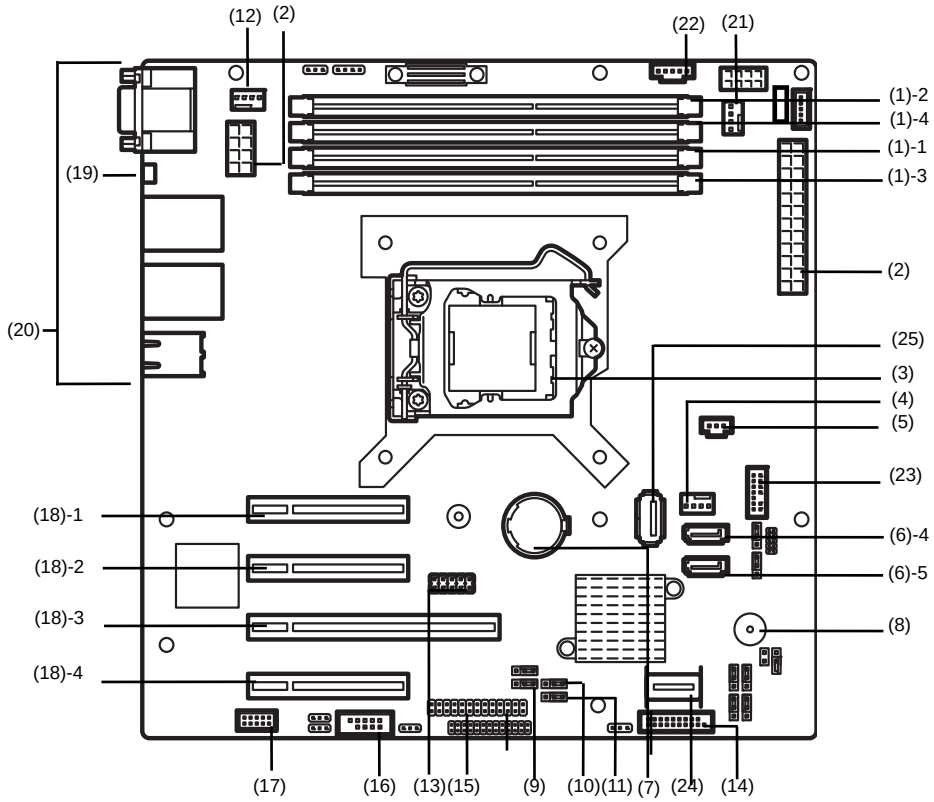
(8) Cooling fan (radiator)

(9) Radiator

(10) PCI slots

(11) Cooling fan (rear)

4.4 Motherboard



(1) DIMM slots (the number after hyphen indicates DIMM number)

(2) Power connector

(3) CPU socket

(4) CPU cooling fan connector (FAN1)

(5) RAID LED cable connector

(6) Serial ATA connector (the number after hyphen indicates connector number)

(7) Lithium battery

(8) Buzzer

(9) CMOS configuration jumper switch

(10) RAID switch jumper

(11) Password clear jumper

(12) Rear fan connector (FAN2)

(13) Internal Flash Memory connector

(14) USB connector (for front)

(15) LED/SW cable connector

(16) Serial port (COM B) connector (for N8117-01A)

(17) SPI Flash Mezzanine connector

EXPRESSSCOPE profile key (SPI flash memory) has been installed, where BIOS and BMC configuration data is stored. Move it when replacing MB to keep using the data.

(18) PCI card slots

(18)-1 PCI EXPRESS x1 (x8 connector)
(18)-2 PCI EXPRESS x1 (x8 connector)
(18)-3 PCI EXPRESS x16 (x16 connector)
(18)-4 PCI EXPRESS x4 (x8 connector)

(19) (Upper) BMC RESET switch

(Lower) DUMP switch (NMI)

(20) External connector

(21) Radiator fan connector (FAN3)

(22) PMBus connector

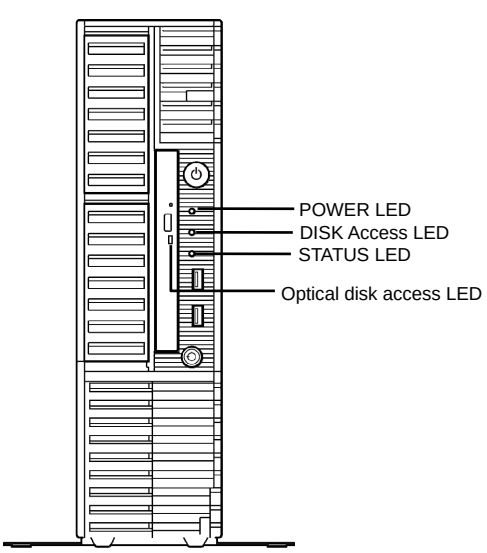
(23) TPM Mezzanine connector

(24) Mini-SAS connector

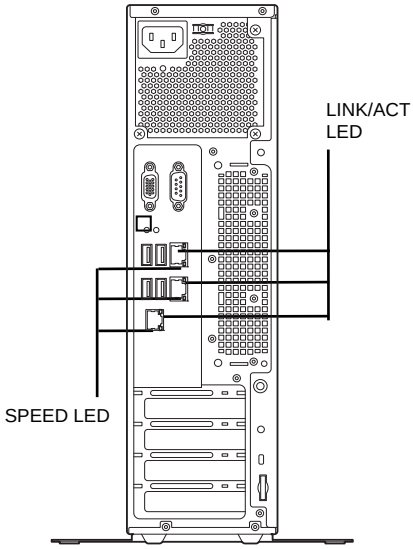
(25) USB connector (for internal)

4.5 Status Indicators

This section explains the indication and meanings of the server LEDs.



Front view



Rear view

4.5.1 POWER LED ( )

POWER LED lights amber during initialization of the system. You can power on the server after the amber POWER LED goes off.

POWER LED lights green while the server is on.

4.5.2 STATUS LED (⚠)

While hardware is operating normally, STATUS LED lights green. STATUS LED is off or lights/flashes amber if there is a problem with hardware.

The following table lists STATUS LED patterns, their explanation and solution.

Tips Refer to the system event log (SEL) by using NEC ESMPRO or the offline maintenance utility to view the cause of failure.

STATUS LED pattern	Explanation	Solution
On (green)	The server is operating normally.	–
Flashing (green)	The server is operating with the memory in degraded state.	Identify the device in degraded state by using the BIOS setup utility *SETUP*, and replace it as soon as possible.
	An uncorrectable memory error has often occurred.	
Off	The power is off.	Turn on the server.
	POST is in progress.	The STATUS LED will turn green after POST completes.
	Watchdog timer expired.	Turn the power off and then turn it on. If the POST screen displays any error message, take notes of the message, and contact your sales representative.
	An uncorrectable error in memory is detected.	
	A PCI bus error occurred.	
	Memory dump is being requested. (e.g. when DUMP switch NMI is pressed) **Note** It remains green if the dump is caused by software.	Wait until the memory dump is completed.
On (amber)	A temperature alarm was detected.	Check the internal fan for dusts. Also check if the fan unit is properly connected. If the LED indication does not change when the fans are normal, contact your sales representative.
	A voltage alarm was detected.	Contact your sales representative.
	A CPU temperature alarm was detected.	
	A CPU error occurred.	Turn the power off and then turn it on. If the POST screen displays any error message, take notes of the message, and contact your sales representative.
	SMI timeout is detected	Contact your sales representative.
	Sensor error was detected.	

STATUS LED pattern	Explanation	Solution
Flashing (amber)	Failure of the power supply unit is detected	Contact your sales representative.
	A fan alarm was detected.	Check if the internal fan cable is properly connected. If the LED indication does not change when the fans are normal, contact your sales representative.
	A temperature warning was detected.	Check the internal fan for dusts. Also check if the fan unit is properly connected. If the LED indication does not change when the fans are normal, contact your sales representative.
	A voltage warning was detected	Contact your sales representative.
	An error was detected on either of the hard disk drives. (Only when a 2.5-inch HDD cage is installed and the RAID System is configured.)	

4.5.3 Disk Access LED ( )

Disk Access LED lights or flashes green when an internal hard disk drive or the optical disk drive is being accessed.

When RAID System using an optional RAID Controller is configured or RAID System is configured with 2.5-inch hard disk drive, this LED lights amber if hard disk drive error occurs. It lights amber and green alternately if the failed hard disk drive is being rebuilt.

Tips When 3.5inch HDD cage is used and RAID Controller (N8103-149/150/151) is used, Disk Access LED may lights amber immediately after the server is powered on or reset, however, it is not a failure.

4.5.4 Optical Disk Access LED

The LED lights/flashes when the media set on the optical disk drive is being accessed.

4.5.5 Disk LED

When 2.5-inch HDD cage is installed, each drive has its respective LED. When the hard disk drive is accessed, the LED lights/flashes green. In RAID System, when a hard disk drive failed, the LED lights amber and then flashes amber when it is being rebuilt.

4.5.6 LINK/ACT LED (1, 2, M)

This LED indicates the state of the standard LAN port. If the server and HUB is supplied with power and connected properly, the LED is on (LINK). If the LAN port is transmitting/receiving data, the LED flashes (ACT).

If the LED does not turn on in LINK state, check the cable or connection.

4.5.7 SPEED LED (1, 2, M)

This LED indicates which network interface is used.

– The two LAN connectors for data transmission support 1000BASE-T, 100BASE-TX, and 10BASE-T and the LED indicates which network interface is being used.
  - Amber: Operating with 1000BASE-T
  - Green: Operating with 100BASE-TX
  - OFF: Operating with 10BASE-T

– The management LAN connector supports 100BASE-TX and the LED lights green during the operation.

NEC Express5800 Series
Express5800/T110f-S

2 Preparations

This chapter describes preparations for using this server.

1. **Installing Internal Optional Devices**

   You can skip this section if you did not purchase any optional devices.

2. **Installation and Connection**

   You must place the server in an ideal location and connect some cables following this section.

1. Installing Internal Optional Devices

This chapter describes the instructions for installing supported optional devices and precautions.
If you did not purchase any optional device requiring installation, you may skip this section.

Important

- **We recommend that optional devices be installed by a maintenance service staff from your maintenance service company, who has specialized knowledge of this server.**
- **Use only the devices and cables specified by NEC. You will be charged to repair damages, malfunctions, and failures caused by the use of any devices or cables not specified for use with this server even within the warranty period.**

1.1 Safety Precautions

Be sure to observe the following precautions to install and remove optional devices properly and safely.

⚠ WARNING

Be sure to observe the following precautions to use the server safety. Failure to observe the precautions may cause death or serious injury. For details, refer to *Safety precautions* in *Precautions for Use*.

- **Do not disassemble, repair, or modify the server.**
- **Do not remove the lithium, NiMH, or Li-ion battery.**
- **Do not handle the server while the power plug is inserted into the outlet.**

⚠ CAUTION

Be sure to observe the following precautions to use of the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to *Safety precautions* in *Precautions for Use.*

- **Do not attempt to lift the server by gripping the front bezel or vent holes cover.**
- **Make sure to complete installation.**
- **Do not get your fingers caught.**
- **High temperature.**

1.2 Anti-static Measures

This product contains static-sensitive electronic components. Follow the measures below to avoid a failure caused by static electricity when installing or uninstalling any optional device.

- **Wearing Anti-static Wrist Strap or Anti-static Gloves**

  Wear a wrist strap on your wrist and connect the wire to the chassis. If there is no wrist strap, touch an unpainted metal surface of the chassis connected to the ground to discharge static electricity from your body before touching the component. Touch the metal part occasionally to discharge the static electricity while working on the component.
- **Checking the Workplace**
  - Work on an anti-static floor or concrete floor.
  - If you work on a place where static electricity is likely to be generated (e.g. carpet), be sure to provide anti-static protection.
- **Using the Work Table**

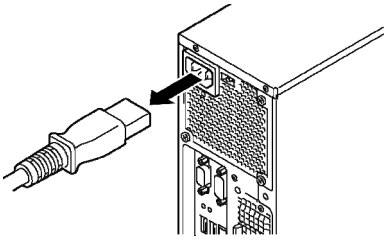
  Place the server on a mat with Electrostatic Discharge (ESD) protection.
- **Clothing**
  - Do not wear wool or synthetic clothes.
  - Wear anti-static shoes.
  - Remove any kind of metal accessories such as a ring, bracelet or wrist watch.
- **Handling of Components**
  - Keep the component in an anti-static bag until you install it to the server.
  - Hold the component by the edges to avoid touching any terminals or mounting parts.
  - Place the component in an anti-static bag when storing or moving them.
- **Handling of Cables**

  When connecting a cable (e.g., LAN cable), static electricity may also be charged due to friction against the floor. Connecting the charged cable with an I/O device may cause damage to the devices in the system. It is recommended to use a product such as electrostatic discharge kit to eliminate the static charge before connecting the cable.
- **Installing and Uninstalling the Optional Device**
  - To avoid electric hazard and malfunction, be sure to turn off the power switch of the server and unplug the power cord from the outlet before installing or uninstalling any optional device. If the device is hot-swappable, you do not need to turn off the power switch and unplug the power cord.
  - The device contains static-sensitive electronic components. When installing or uninstalling the optional device, wear an anti-static wrist strap on your wrist to avoid a failure caused by the static electricity. To use the strap, connect the wire to the chassis

1.3 Overview of Installation and Removal

Install/remove components by using the following procedure.

1. If the server is ON, turn it off.
   Refer to *Chapter 3* (6. *Turning off the Server*).
2. Disconnect the power cord from the outlet and the server.



3. Disconnect all cables connected to the connector at the rear.
4. Remove the side cover.
   Refer to *Chapter 2 (1.4. Removing the Side Cover)*.
5. Remove the front bezel if applicable.
   Refer to *Chapter 2 (1.5 Removing the Front Bezel)*.
6. Depending on the components to be installed or removed, follow the procedure in order.
   Refer to *Chapter 2* (*1.6 Internal Flash Memory* to *1.14 Backup devices).*
7. Connect cables
   Refer to *Chapter 2* (*1.15 Connecting cables)*.
8. Attach the front bezel.
   Refer to *Chapter 2 (1.16 Attaching the Front Bezel).*
9. Attach the side cover.
   Refer to *Chapter 2* (*1.17 Installing the Side Cover)*.

This is the end of the installation or removal procedures for internal optional devices.

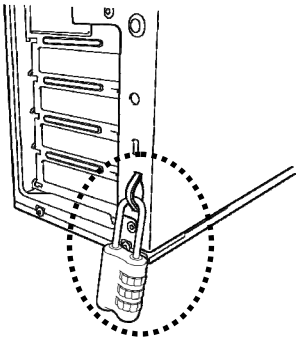
Continue the setup with reference to *Chapter 2 (2.2 Connection)*.

1.4 Removing the Side Cover

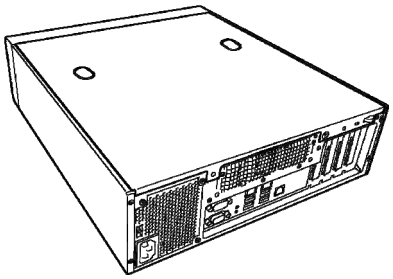
Remove the side cover by using the following procedure.

1. Refer to steps 1 to 3 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.

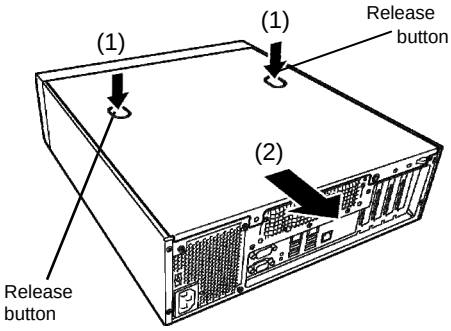
2. Unlock the padlock attached to the chassis if applicable.

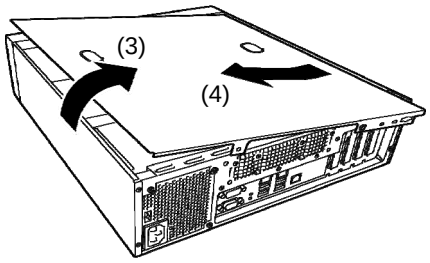


3. Lay the server so that the side cover faces upward. Lay it down slowly and gently.



4. While pressing the two release buttons (1), slide the cover toward the rear of the server (2), lift it in the direction shown by the arrow (3), and then remove the cover in the direction shown by the arrow (4).

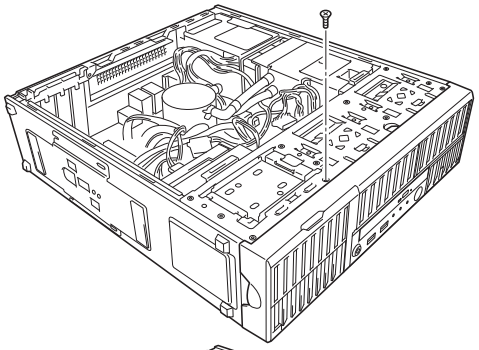




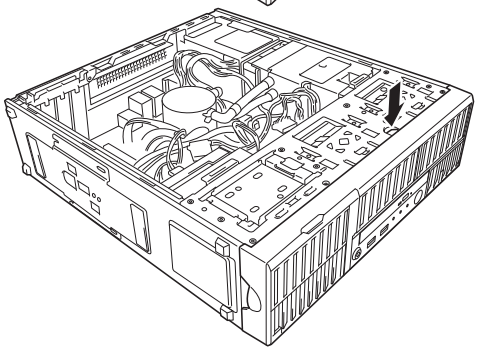
1.5 Removing the Front Bezel

Remove the front bezel by using the following procedure.

1. Refer to steps 1 to 3 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Remove the screw.

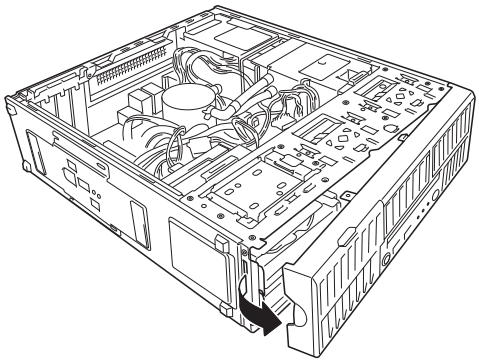


3. Place the server in the direction shown in the figure, and then pull the front bezel slightly toward the front until the tab can be released from the frame.



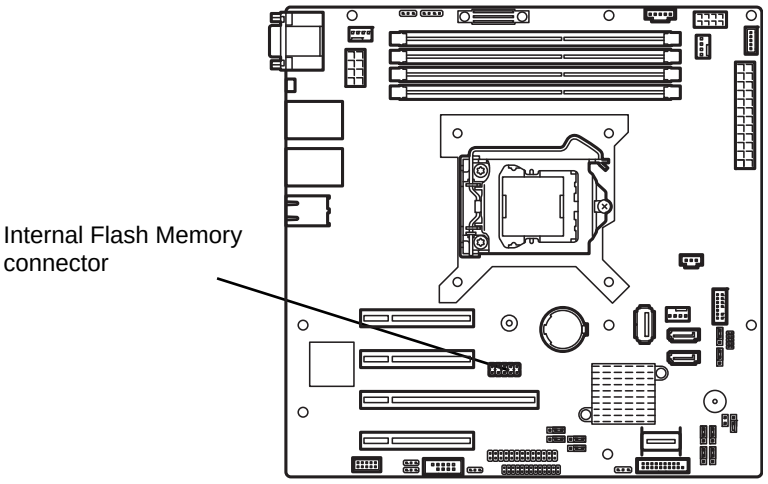
Important **If you pull the front bezel forward too much, you will break the front bezel. Gently slide it to prevent damaging the equipment.**

4. Slide the front bezel forward to release the hooks that engaged with the holes at the front of the server and take it off the server.



1.6 Internal Flash Memory

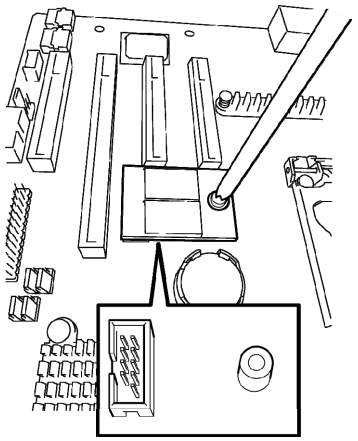
This section describes the procedure for installing the Internal Flash Memory.



1.6.1 Installation

Install the Internal Flash Memory in the following procedure.

1. Refer to steps 1 to 5 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Attach the Internal Flash Memory and fix it with the screw that comes with this product.

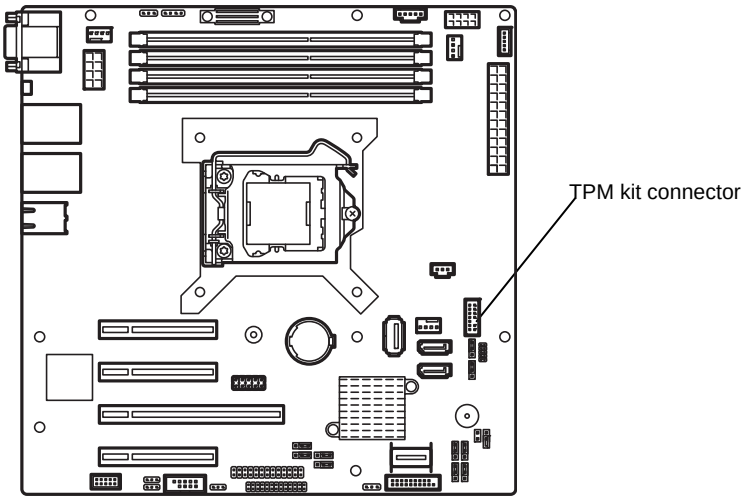


1.6.2 Removal

To remove the Internal Flash Memory, reverse the installation procedure.

1.7 TPM Kit

This section describes the procedure for installing optional TPM Kit.

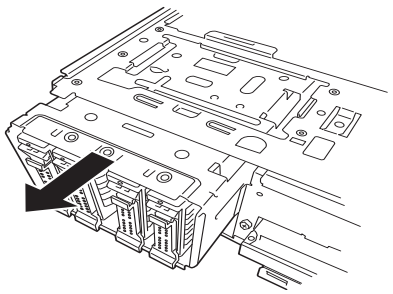


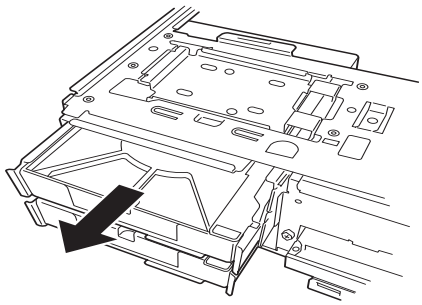
1.7.1 Installation

Install the TPM Kit in accordance with the following procedure.

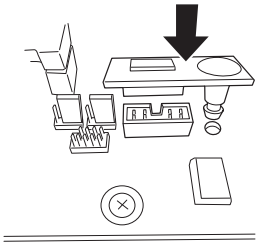
Note The TPM kit once installed cannot be removed.

1. Refer to steps 1 to 5 in *Chapter 2* (*1.3 Overview of Installation and Removal*) for preparations.
2. Pull the hard disk drive cage toward the front according to the steps in *Chapter 2* (*1.12 HDD Cages*). (For a 3.5-inch hard disk drive cage, only pull the hard disk drive.)





3. Install the TPM Kit and secure it by pushing the nylon rivet that comes with the TPM Kit.



4. Mount the parts that were removed in steps 1 and 2.

1.8 DIMM

Install a DIMM (Dual In-line Memory Module) to a DIMM slot on the motherboard in the server. The motherboard provides four slots to install DIMMs.

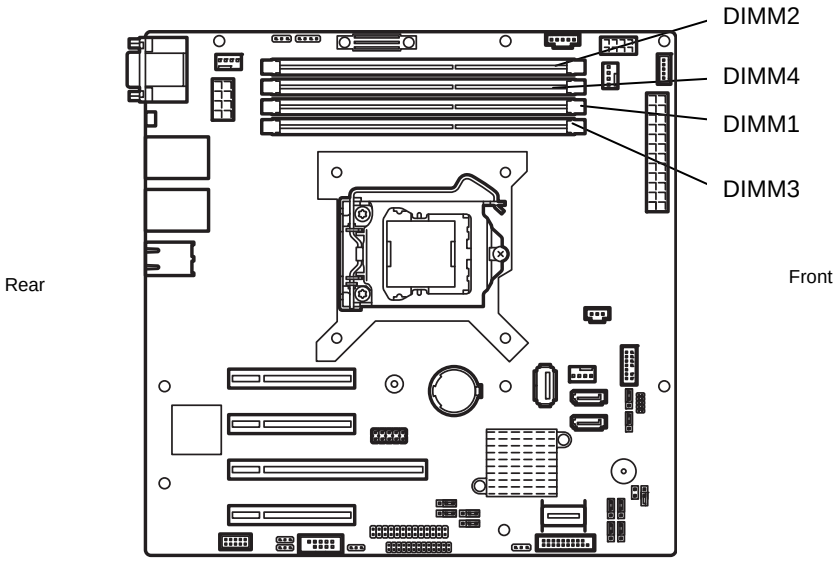
Up to 32 GB (8 GB × 4) of memory can be installed.

Important

- **Use only the DIMMs specified by NEC. Installing a DIMM from a third party may cause the server to fail. (You will be charged to repair failures or damages caused by the use of such products even within the warranty period.)**
- **Read through *Chapter 2 (1.2 Anti-static Measures)* beforehand.**

Tips

As about 750 MB of memory is used for PCI resources, the available memory size may be less than the mounted memory size.



Motherboard

This server supports 2-way Interleave mode.

If you run the server in 2-way Interleave mode, the data transfer speed of the memory doubles.

1.8.1 Maximum supported memory size

The maximum available memory size on the server depends on the architecture (x86 architecture) and OS specs.

A list of maximum memory sizes

OS	The maximum memory size supported on each OS	The maximum memory size supported on the server
Windows Server 2008 Standard	4 GB	4 GB (If using HW-DEP function) * Default factory settings
		About 3.5 GB (If not using HW-DEP function) Note: When **Execute Disable Bit (XD Bit)** is set to **Disabled** in BIOS SETUP.
Windows Server 2008 R2 Standard (x64)	32 GB	32 GB
Windows Server 2008 Enterprise	64 GB	
Windows Server 2008 R2 Enterprise	2 TB	
Windows Server 2012 Standard Windows Server 2012 Datacenter	4 TB	
Red Hat Enterprise Linux 5 Red Hat Enterprise Linux 6	16 GB	16 GB
Red Hat Enterprise Linux 5 (EM64T)	1 TB	32 GB
Red Hat Enterprise Linux 6 (x86_64)	3 TB	
VMware ESXi 5.1	2 TB	32 GB Up to 1 TB of the main memory is available to each virtual machine.

1.8.2 Installation order

Install DIMMs one by one in order of increasing memory size into slots in the order of DIMM#1, DIMM#2, DIMM#3, and DIMM#4. However, if you want to run the server in 2Way Interleave mode, observe the following when installing the DIMMs:

- Install DIMMs in pairs
- The two DIMMs installed together must be of the same specifications and memory size.
- Install the pairs as DIMM#1 and DIMM#2, or DIMM#3 and DIMM#4 (the installation order between the pairs does not matter.)

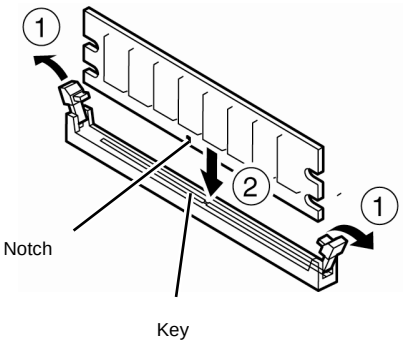
Installation examples

Example	2Way Interleave	DIMM#1	DIMM#2	DIMM#3	DIMM#4
1	Runs	2 GB DIMM (Standard)	2 GB DIMM	Not installed	Not installed
2	Runs	2 GB DIMM (Standard)	2 GB DIMM	2 GB DIMM	2 GB DIMM
3	Does not run	2 GB DIMM (Standard)	2 GB DIMM	2 GB DIMM	Not installed
4	Does not run	2 GB DIMM (Standard)	2 GB DIMM	Not installed	2 GB DIMM

1.8.3 Installation

Install a DIMM by using the following procedure.

1. Refer to steps 1 to 5 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Hold the server with both hands and slowly and gently lay it so that the left side faces upward
3. Rotate both levers of the target DIMM slot outward.
4. Hold the DIMM vertically and push it all the way into the slot.
   When the DIMM is inserted into the slot, the lever automatically closes.



Important **Applying too much pressure on a DIMM or inserting a DIMM at an angle may break the DIMM or slot. Gently insert it straight into the slot.**

Note Align the notch on the DIMM with the key on the slot.

5. Firmly close the lever.
6. Continue to install or remove internal optional devices, mount and connect the server, and turn it on.
7. Confirm that no error messages are displayed in POST screen.
   If any error messages are displayed, refer to *Chapter 3 (1. POST Error Message)* in "*Maintenance Guide*".
8. Run the SETUP Utility, go to the **Advanced** menu, and check the display in **Memory Configuration**. Confirm that the added DIMM has been recognized in the BIOS (Confirm that the applicable **DIMM Group Status** is set to Normal.). (Refer to *Chapter 2 (1. Details of System BIOS)* in "*Maintenance Guide*".)
9. Set the paging file size to the recommended value (Total memory size x 1.5) or more.
   If using a Windows OS, refer to *Chapter 1 (7.1 Specifying Memory Dump Settings (Debug Information))* in "*Installation Guide (Windows)*".
   For other OS, consult the manual provided with the operation system or contact the store where you purchased it or your maintenance service company.

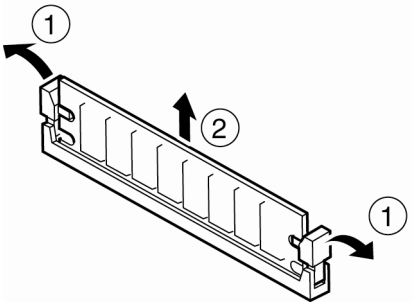
1.8.4 Removal

Remove a DIMM in the following procedure.

Note

- When removing a defective DIMM, check error messages displayed at POST or NEC ESMPRO and check the DIMM slot where the defective DIMM is installed.
- At least one DIMM needs to be installed for the server to operate.

1. Refer to steps 1 to 5 in *Chapter 2 (1.3 Overview of Installation and Removal* for preparations.
2. Rotate both levers of the target DIMM slot outward.
   The DIMM is unlocked
3. Remove the DIMM by pulling it out from the slot in a straight direction.



Important **Applying too much pressure on a DIMM or pulling a DIMM at an angle may break the DIMM or slot. Gently pull it straight out of the slot.**

4. Assemble the server.
5. Turn on the server and confirm that no error messages are displayed on POST. If any error message is displayed, refer to *Chapter 3 (1. Post Error Message)* in "*Maintenance Guide*".
6. If you replaced a broken DIMM, select **Yes** in **Memory Configuration**-**Memory Retest** of the **Advanced** menu.
   After that, select **Save Changes and Exit** to reboot.
7. Set the paging file size to the recommended value (Total memory size x 1.5) or more.
   If using a Windows OS, refer to *Chapter 1 (7.1 Specifying Memory Dump Settings (Debug Information))* in "*Installation Guide (Windows)*".
   For other OS, consult the manual provided with the operation system or contact the store where you purchased it or your maintenance service company.

1.9 Use of Internal Hard Disk Drives in the RAID System

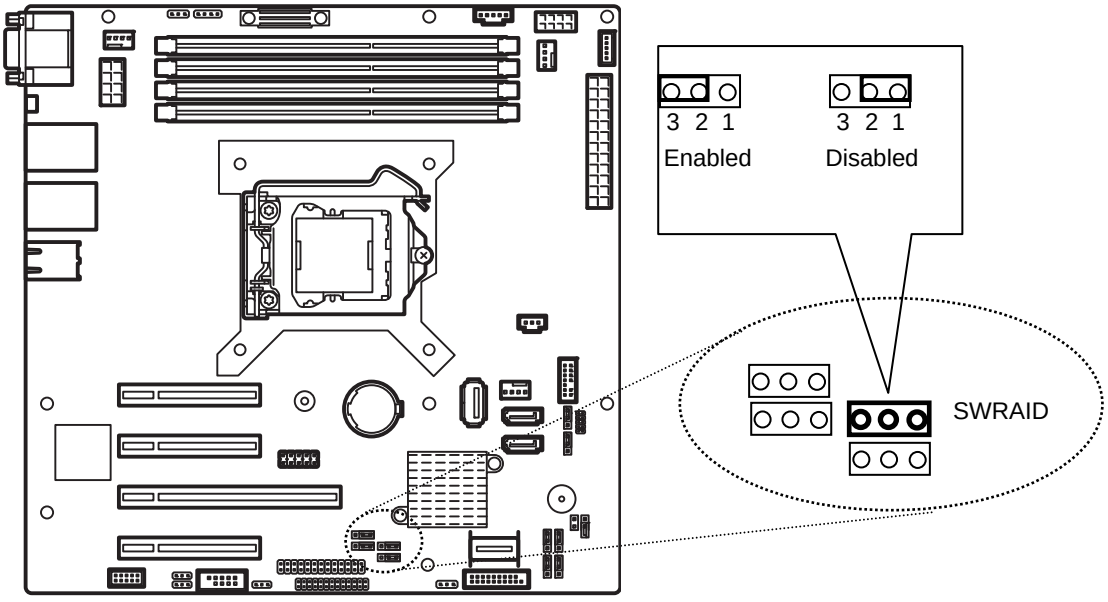
This section describes how to use the Hard Disk Drives installed in the HDD cage at the front of the server in the RAID System.

Important **If you use Hard Disk Drives in the RAID System or change the RAID level, initialize the Hard Disk Drives. If the Hard Disk Drive used in the RAID System contains valuable data, be sure to backup the Hard Disk Drive before installing the RAID Controller and configuring the RAID System.**

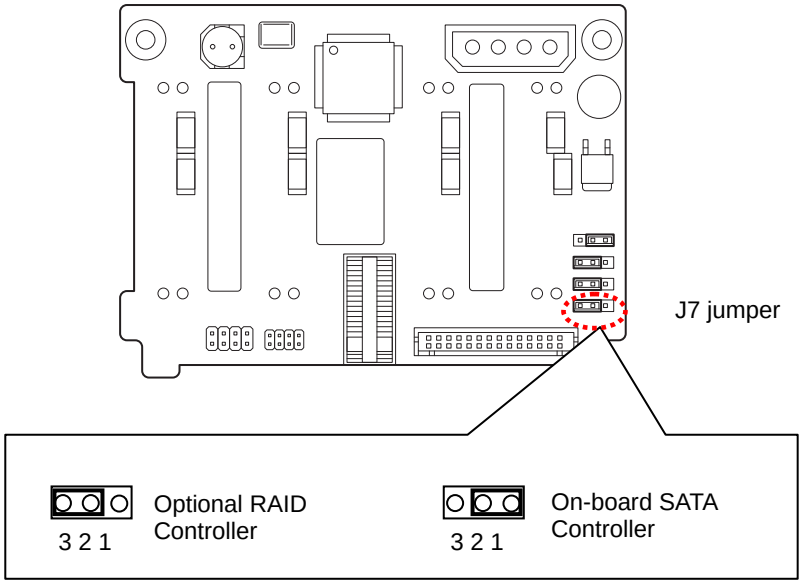
Note In the RAID System, use Hard Disk Drives that have the same specifications (capacity, rotational speed, and standard) for each Disk Array.

Tips Logical Drives can be created even with only one Physical Device.

To build a RAID System, change jumper switch settings on motherboard and backplane, as shown below.



Motherboard



Backplane for 2.5-inch Hard Disk Drives (when a 2.5-inch HDD cage is installed)

(a) When using on-board RAID Controllers (LSI Embedded MegaRAID™)

Change jumper switch setting as shown below.

Jumper pins on motherboard (SWRAID)
Change jumper setting to 2-3 (Enabled).

[When using 2.5-inch Hard Disk Drive]

Backplane for 2.5-inch Hard Disk Drive (provided with 2.5-inch HDD cage) (J7)

Change jumper setting to 1-2 (Onboard SATA controller).

[When using 3.5-inch Hard Disk Drive]

No setting other than the jumper pin on the motherboard is required.

After that, configure the RAID System using LSI Software RAID Configuration Utility.

For details, refer to *Chapter 2 (4. RAID System Configuration)* in "*Maintenance Guide*".

Tips If you use the EXPRESSBUILDER DVD supplied with the server for setup, the RAID System is automatically configured. Or, you intend to install Windows OS, OS also can be installed automatically and seamlessly.

(b) If an optional RAID Controller is used

Jumper pins on motherboard (SWRAID)
Change jumper setting to 1-2 (Disabled).

Backplane for 2.5-inch Hard Disk Drive (provided with 2.5-inch models) (J7)

Change jumper setting to 2-3 (Optional RAID Controller)

Note When installing an optional RAID Controller, start the BIOS Setup utility, select **PCI Configuration** from the **Advanced** menu, and then make sure that the parameter of **PCI Slot *xx* ROM** (*xx* is PCI slot number) is set to **Enabled**.

Important **Do not change the mode to hibernate when building a RAID System.**

(c) Installation

For the instruction of installing the optional RAID Controller, refer to *Chapter 2 (1.11 PCI Card)*.

Important **When connecting a RAID Controller, set the boot priority to 8th or higher in the Boot menu of the BIOS Setup utility. If the setting is 9th or lower, the configuration menu for RAID Controllers cannot be launched.**

(d) Removal

To remove the optional RAID Controller, reverse the installation procedure.

If you intend to use with the card removed, be sure to attach the blank cover attached to the riser card.

1.9.1 Notes on setting up a RAID System

Note the following points when setting up a RAID System.

- The number of Hard Disk Drives required varies in each RAID level.
- If an on-board RAID Controller or optional RAID Controller (N8103-128/149) is used, the RAID System cannot be built in RAID5/RAID6.

RAID level	The minimum number of Hard Disk Drives required to set up a RAID System	
	On-board RAID Controller or N8103-171/149	N8103-171/151/167
RAID 0	1	1
RAID 1	2	2
RAID 5		3
RAID 6		3
RAID 10	4	4
RAID 50		6
RAID 60		6

- Use SAS/SATA Hard Disk Drives or SSDs that have the same capacity and rotational speed.
- As the size of Logical Drive cannot be specified in RAID 10 with the on-board RAID Controller, the Logical Drive size will be at least 4 TB if a Hard Disk Drive of 2 TB or more is used. However, the Logical Drive where the OS is to be installed may be up to 2 TB due to OS restrictions, and therefore RAID 10 using a Hard Disk Drive of 2 TB or more cannot be supported if an on-board RAID Controller is used.

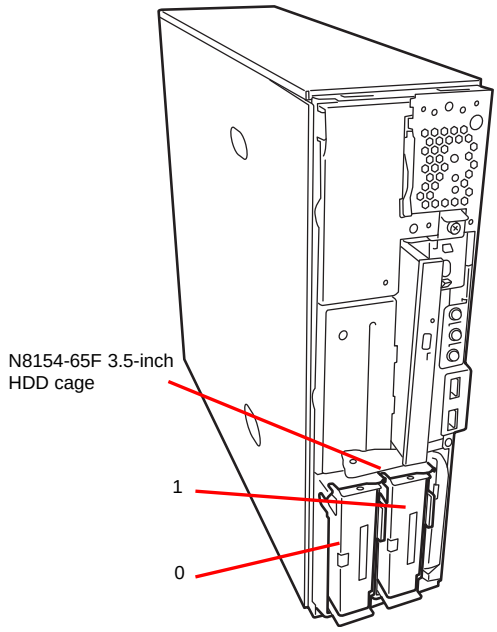
When installing an OS in your RAID System, you can easily complete the setup process, including RAID configuration and OS installation, by using EXPRESSBUILDER. If you are installing the OS manually, use the RAID System configuration utility. The utility can be run during POST which starts immediately after the server is turned on. For details on the procedure of configuring a Logical Drive, refer to *Chapter 2 (4. RAID System Configuration)* in "*Maintenance Guide*" or the manual supplied with the optional RAID Controller.

Important

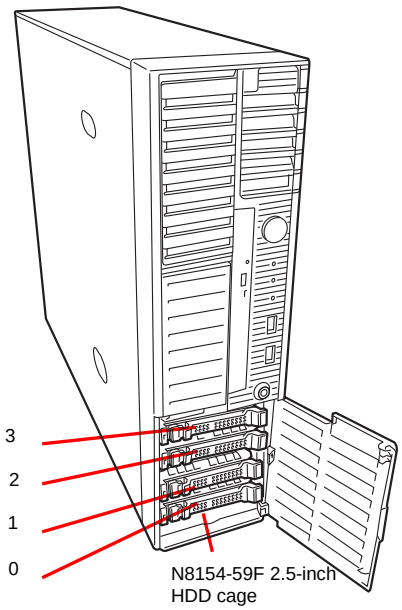
- **Do not change the RAID System mode to hibernate.**
- **A mix of SAS and SATA drives cannot be used within the RAID System.**

The insert position number displayed on the server

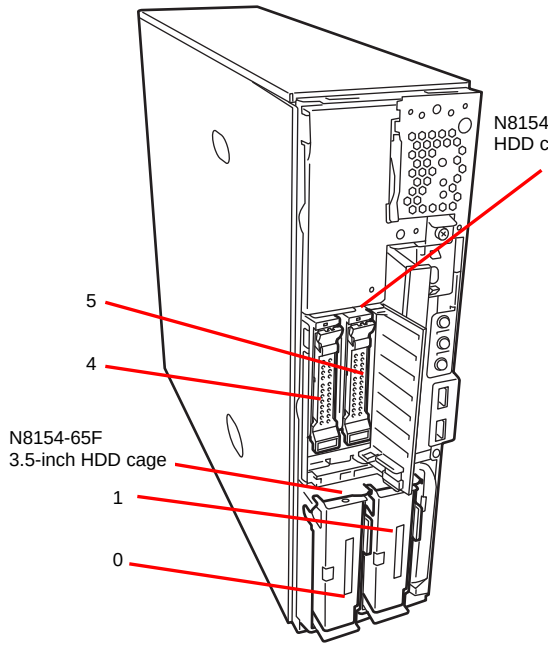
<3.5-inch HDD cage>



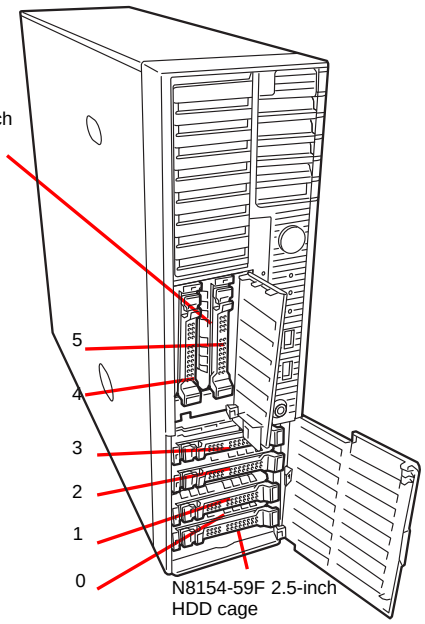
<2.5-inch HDD cage>



<3.5-inch HDD cage and extra 2.5-inch HDD cage>



<2.5-inch HDD cage and extra 2.5-inch HDD cage>



1.10 Extra Battery for RAID Controller

If a RAID Controller (N8103-149/150/151/167) is installed, use the optional extra battery to avoid data loss caused by accidents including temporary blackout during a write-back operation. The model of the extra battery to be used depends on RAID Controller.

- N8103-149/150/151, use N8103-155 extra battery
- For N8103-167, use flash backup unit that comes with N8103-157 RAID controller

1.10.1 Handling precautions

Below are the precautions to be observed whenever using the backup battery. Be sure to observe the following, otherwise property such as data or other devices might be destroyed.

- Use the extra battery that supports the RAID Controller used.
- The extra battery is a very delicate electronic device. Before installation, touch the metal frame part of the server to discharge the static electricity from your body.
- Do not drop or bump the backup battery.
- For recycling and disposing the backup battery, refer to the user's guide that comes with it.

1.10.2 Installing N8103-155 extra battery

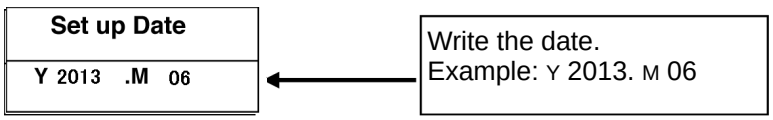
Install an extra battery in the server by using the following procedure.

Note Read through the user's guide supplied with the RAID Controller before installation.

Filling out the date on the Set up date label

Write down the installation date (year and month) on the Set up date label supplied with the extra battery. Attach the label on the battery cover or somewhere easy to find on the server.

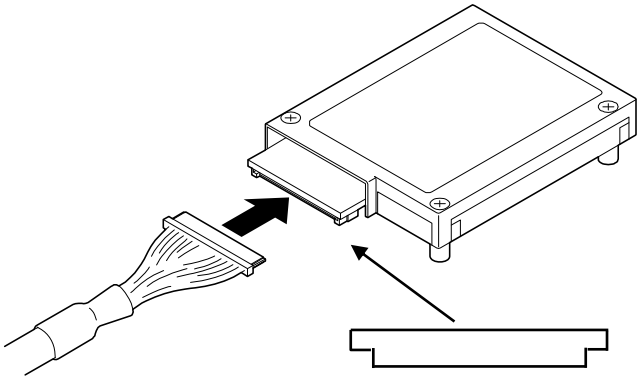
Fill out the *Set up date* label supplied with the battery



Important **The shelf life of the battery pack is about two years though actual life depends on the operating environment and conditions. If it has been used for two years or more, the maximum data backup time is not guaranteed. Replace it soon with a new battery pack, referring to the user's guide for the extra battery.**

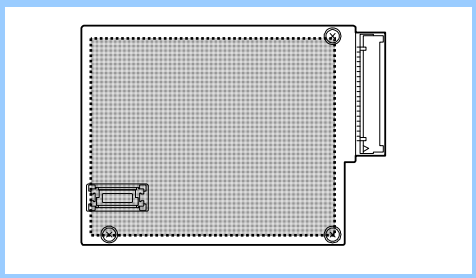
Connecting the battery control cable

Referring to the image below, connect the battery control cable into the battery pack. Check the orientation of the connector and connect the cable straight into the connector.



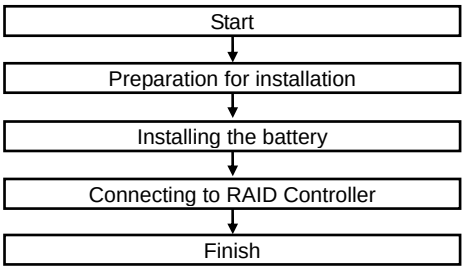
The upper portion is wider than that of lower portion.

Important **When installing or removing the extra battery, pay special attention not to apply excessive pressure on the part of the battery cover marked in the image below. Otherwise, the part may break.**



Installing the battery in the server

This section describes how to install this product in the server.

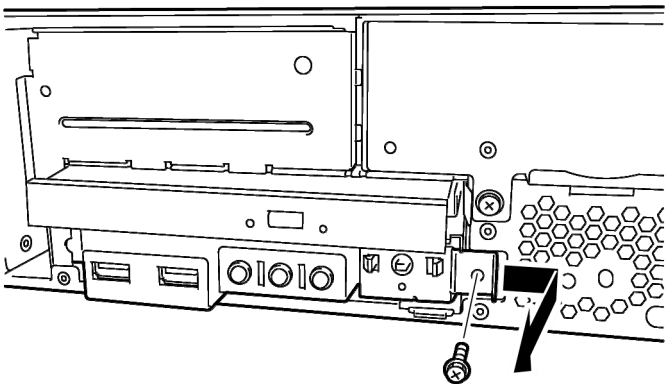


Getting ready to install the battery

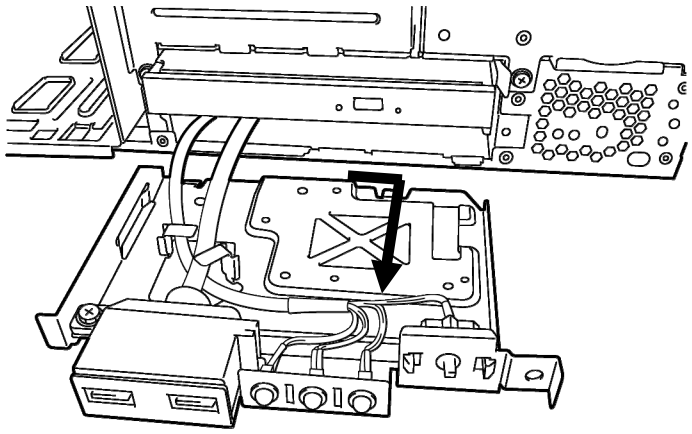
1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. While referring to *Chapter 2 (1.4 Removing the Side Cover* and *1.5 Removing the Front Bezel*, remove the side cover and front bezel.

Installing the battery pack

1. Remove one screw from the front panel bracket.

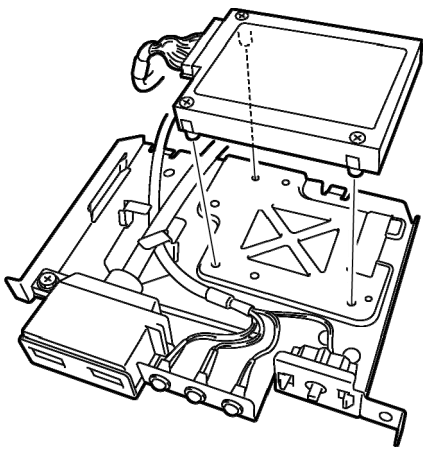


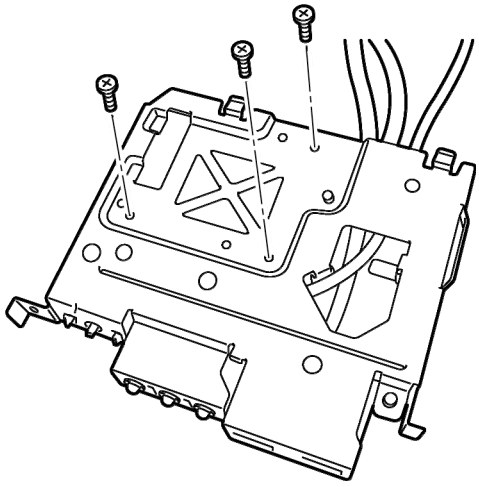
2. Slide the front panel bracket slightly toward the right, and then pull the bracket toward the front to remove it.



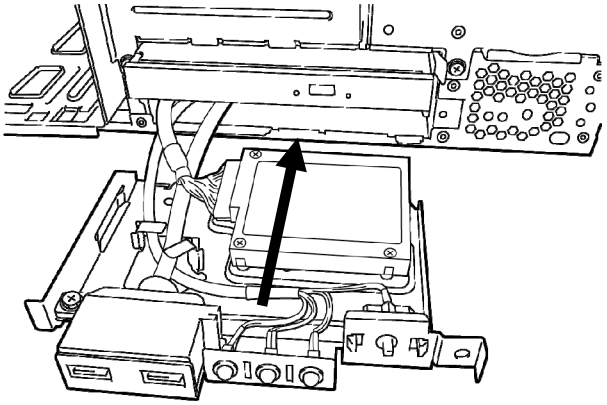
Important **Be careful so that the cable does not come out from the connector when pulling the front panel bracket.**

3. Mount the battery from the rear side of the front panel bracket by using three screws.





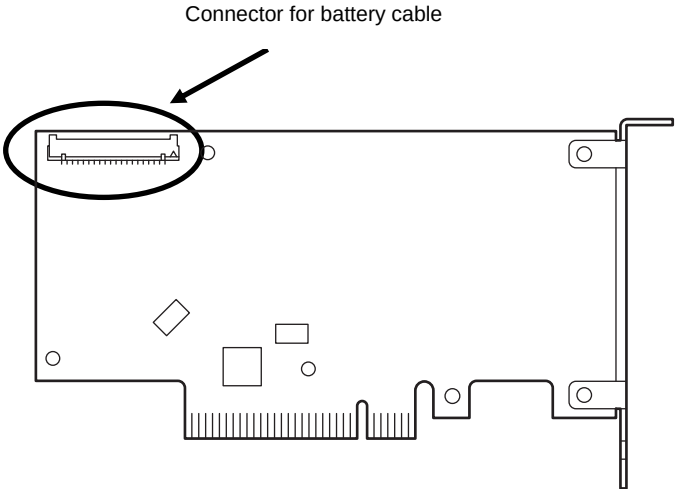
4. Draw the cable into the chassis and mount the front panel bracket on the server chassis in the reverse order of the removal procedure.



Connecting to a RAID Controller

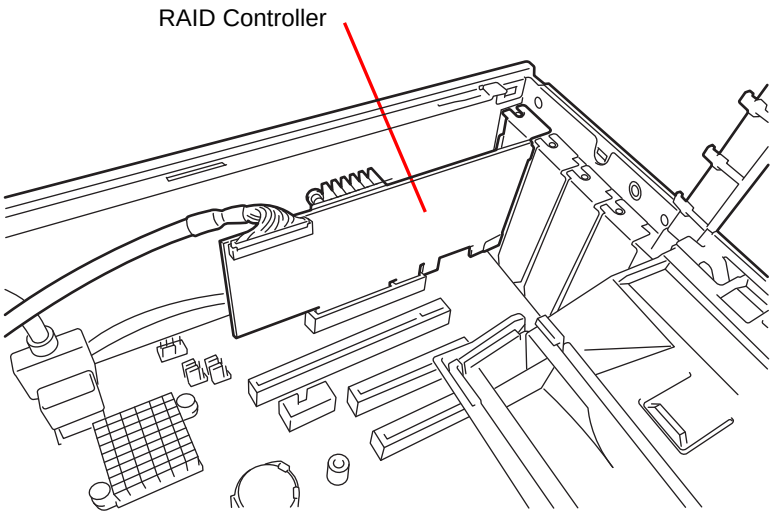
1. Connect another connector of the flash backup unit control cable to the connector on the RAID Controller. Check the orientation of the connector and connect the cable straight into the connector. Be careful not to press it in at an angle when connecting.

   Position of the connector
   Connect the cable to the connector shown in the figure below.



Rear face of RAID controller

2. Install the RAID Controller into the PCI slot #4 and fix it in place. Be careful not to disconnect the battery control cable.



3. Connect the cables and components that you removed earlier.

1.10.3 Removal

To remove the extra battery for the RAID Controller, reverse the installation procedure.

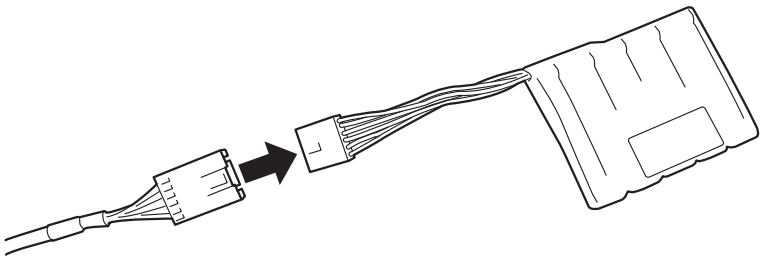
1.10.4 Installing the flash backup unit that comes with N8103-167

Install the flash backup unit that comes with N8103-167 RAID Controller the by using the following procedure.

Note Read through the user's guide supplied with the RAID Controller before installation.

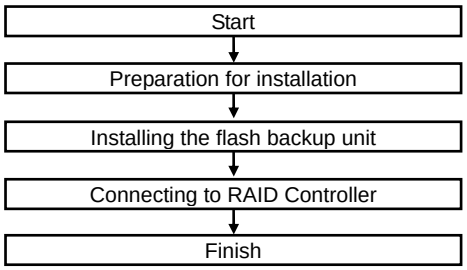
Connecting the flash backup unit control cable

Referring to the image below, connect the flash backup unit control cable into the battery pack. Check the orientation of the connector and connect the cable straight into the connector.



Installing the flash backup unit in the server

This section describes how to install this product in the server.

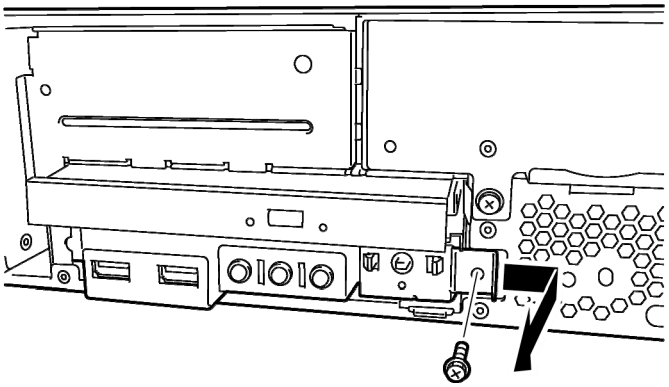


Getting ready to install the battery

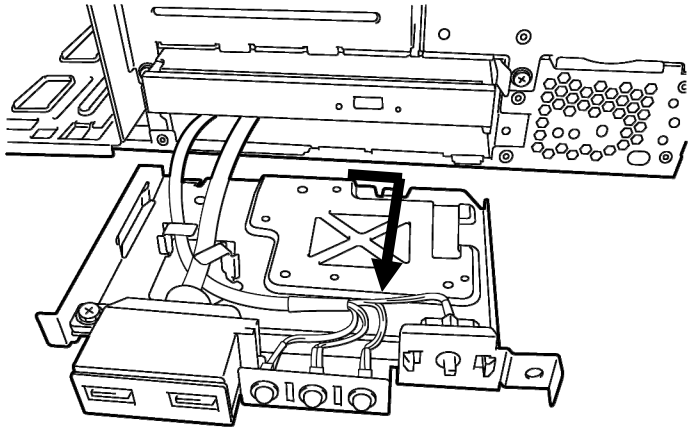
1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. While referring to *Chapter 2 (1.4 Removing the Side Cover* and *1.5 Removing the Front Bezel*, remove the side cover and front bezel.

Installing the flash backup unit

1. Remove one screw from the front panel bracket.

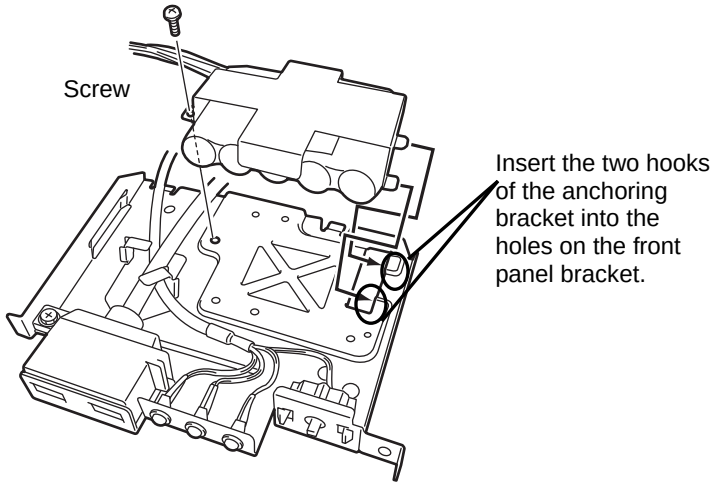


2. Slide the front panel bracket slightly toward the right, and then pull the bracket toward the front to remove it.

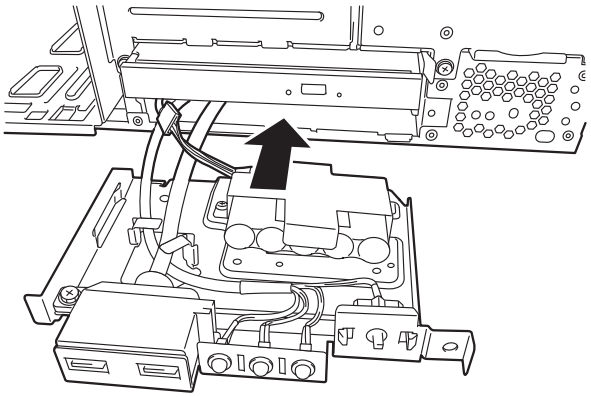


Important **Be careful so that the cable does not come out from the connector when pulling the front panel bracket.**

3. Mount the flash backup unit on the RAID Controller by using the anchoring bracket that comes with the RAID Controller and secure it by using a single screw.



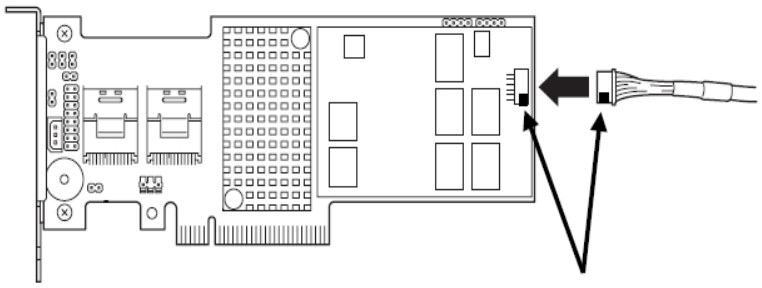
4. Draw the cable into the chassis and mount the front panel bracket on the server chassis in the reverse order of the removal procedure.



Connecting to a RAID Controller

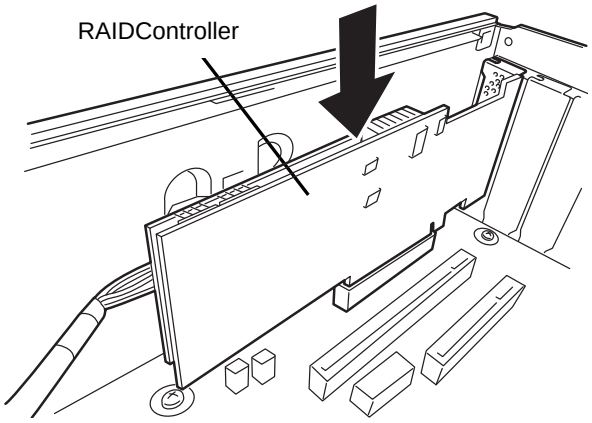
1. Connect another connector of the flash backup unit control cable to the connector on the RAID Controller. Check the orientation of the connector and connect the cable straight into the connector. Be careful not to press it in at an angle when connecting.

Position of the connector
Connect the cable to the connector shown in the figure below.



RAID Controller

2. Install the RAID Controller into the PCI slot #4 and fix it in place. Be careful not to disconnect the cable.



3. Connect the cables and components that you removed earlier.

1.10.5 Removal

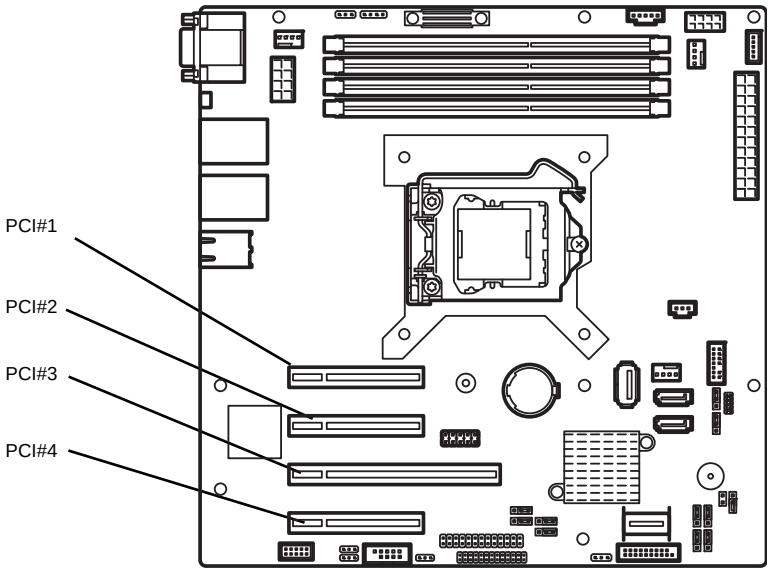
To remove the flash backup unit, reverse the installation procedure.

1.11 PCI Card

This server provides four slots where PCI cards can be installed.

Important

- **You must avoid static electricity to work with the procedure below. For details, refer to Chapter 2 (1.2 Anti-static Measures).**
- **When installing PCI cards, refer to *Chapter 2 (1.11.2 List of optional devices and installation slots)* to prevent mistaking slot numbers.**
- **Configure the Option ROM in [PCI Configuration] according to the application of the installed PCI card. For the configuration instructions, refer to *Chapter 2 (1. Details of system BIOS)* in "*Maintenance Guide*". Disabling the deployment of Option ROM can not only prevent memory consumption but also shorten the startup time.**



Motherboard

1.11.1 Notes

Read the following notes when installing or removing a PCI card.

- Do not touch the terminals of cards and the leads of electronic components with your bare hand. Fingerprints and dust left on them cause the server to malfunction due to a connection failure or damage to the leads.
- The search order for PCI bus slot on boot is as follows.
  Slot 3 → Slot 4 → Slot 1 → Slot 2
- The PCI devices of the same type (including onboard PCI device) may be recognized in different order from that described above, depending on OS or RAID System BIOS utility. Check the slot location of PCI device by PCI bus number, device number and function number shown in the table below.

PCI device	PCI bus number	Device number	Function number
Onboard NIC1	3h	0	0
Onboard NIC2	3h	0	1
Slot 1	41h	0	×
Slot 2	59h	0	×
Slot 3	1h	0	×
Slot 4	21h	0	0

- Set **Disabled** for the optional ROM of a LAN device not to be booted by using the BIOS Setup utility.
- If an additional bootable PCI card (such as a RAID Controller, SAS controller, or LAN card) is installed, the boot priority may change. After the installation, set the boot priority in the **Boot** menu of the BIOS Setup utility.
- If a bootable device such as a PCI card or USB device is added, the boot order may change.
  In the BIOS Setup utility, select **Hard Drive BBS Priorities** from the **Boot** menu, and then specify a higher priority for the boot device.
  Boot → **Hard Drive BBS Priorities** → Check the display
  If the boot device is an HDD under an optional RAID Controller, the display is `(Bus xx Dev 00) PCI RAID Adapter`.
  Note that the value for *xx* changes depending on the PCI slot where a RAID board is installed.

1.11.2 List of optional devices and installation slots

Model name	Product name		PCI EXPRESS				Remark	
			2.0		3.0	2.0		
			PCI#1	PCI#2	PCI#3	PCI#4		
		PCI slot performance*1	X1 lane	X1 lane	x16 lane	x4 lane		
		PCI slot size	Low Profile					
		PCI board socket type*1	x8	x8	x16	x8		
		Size of mountable board	168 mm or less					
N8103-142	SAS controller (card performance: PCI EXPRESS 2.0 (x8))		–	○	○	○	For connecting internal/external devices. Cannot be connected to internal hard disk drives.	
N8103-G171	RAID controller (128 MB, RAID 0/1) (card performance: PCI EXPRESS 2.0 (x8))		–	–	–	○	For connecting internal hard disk drives (dedicated for pre-installation model) Cannot be connected to an extra battery.	Cannot be used when a 3.5-inch HDD cage is installed together with a 2.5-inch extra HDD cage.
N8103-171	RAID controller (128 MB, RAID 0/1) (card performance: PCI EXPRESS 2.0 (x8))		–	–	–	○	For connecting internal hard disk drives Cannot be connected to an extra battery.	
N8103-149	RAID controller (512 MB, RAID 0/1) (card performance: PCI EXPRESS 2.0 (x8))		–	–	–	○	For connecting internal hard disk drives Can be connected to an extra battery (N8103-155)	–
N8103-150*3	RAID controller (512 MB, RAID 0/1/5/6) (card performance: PCI EXPRESS 2.0 (x8))		–	–	–	○		Cannot be used when a 3.5-inch HDD cage is installed.
N8103-151	RAID controller (1 GB, RAID 0/1/5/6) (card performance: PCI EXPRESS 2.0 (x8))		–	–	–	○		
N8103-167*3	RAID controller (1 GB, RAID 0/1/5/6) (card performance: PCI EXPRESS 3.0 (x8))		–	–	–	○	For connecting internal hard disk drives The RAID cache can be backed up by using the flash backup unit that comes with N8103-167.	
N8104-138	1000BASE-T connection board (1ch) (card performance: PCI EXPRESS (x1))		○	○	○	○	For additional LAN Card type: PCI Express 2.0(x4)	
N8104-132	1000BASE-T connection board (2ch) (card performance: PCI EXPRESS (x1))		○	○	○	○	For additional LAN Card type: PCI Express 2.0(x4)	
N8117-01A	Expansion RS-232C connector kit*2		○	○	○	○	For additional serial port (RS-232C)	

○ Can be installed – Cannot be installed

*1 Lane: Indicates the transfer performance (transfer bandwidth).
<e.g.> 1 lane = 2.5 Gbps (unidirectional), 4 lanes = 10 Gbps (unidirectional)
Socket: Indicates the connector size. A card up to the number of sockets can be connected.
<e.g.> x4 socket = x1 card, x4 card can be installed. x8 card cannot be installed.

*2 The N8117-01A expansion RS-232C connector kit contains two types of cables. This server uses the RS-232C cable (B).

*3 3.5-inch HDD is not supported.

- The depth of mountable boards is up to 168 mm (MD2).
- For details of functions of each card, refer to the technical guide.
- The card performance described in the parentheses after the Product name indicates the maximum operation performance of the card.
- Even if you use PCI cards of a higher performance than the PCI slot, the operation of the device will be that of the PCI slot.

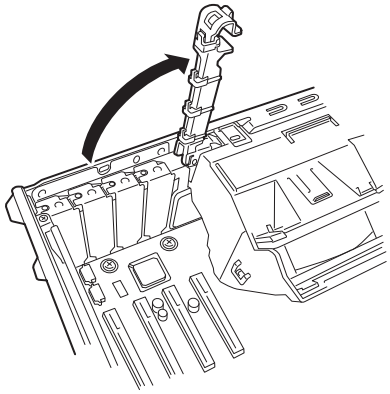
About the standard network

You can use functional equivalents of AFT/SFT/ALB teaming and bonding with the standard network and the following LAN cards:
N8104-132 and N8104-138

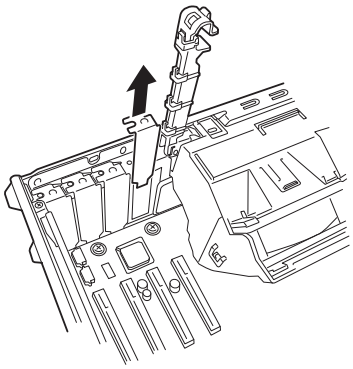
1.11.3 Installation

Install a PCI card to connect to a PCI slot by using the following procedure.

1. Before installation, make sure the switch or jumper settings on the card are properly set according to the instruction manual supplied with the card if necessary.
2. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
3. Remove the side cover while referring to *Chapter 2 (1.4* Removing the Side Cover*)*.
4. Open the PCI slot retention latch.

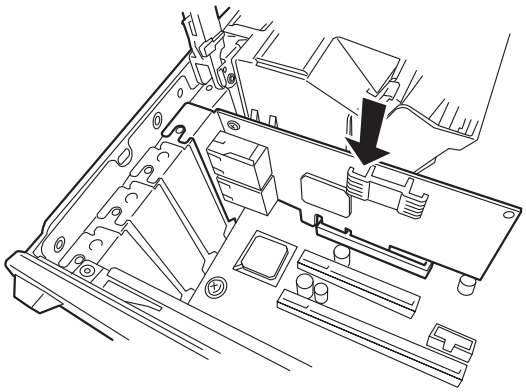


5. Remove the blank cover aligned with the slot where you are going to install a card.



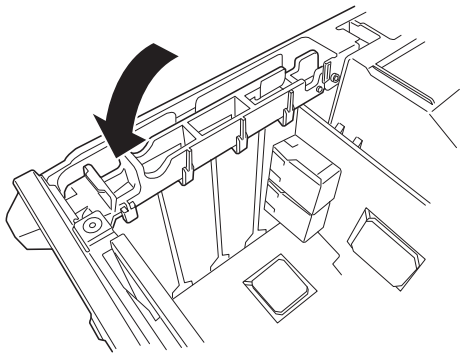
Important **Keep the removed blank cover for future use.**

6. Orient the component side of the card toward the bottom of the server. When the rear panel of the card is firmly engaged with the spring, firmly press the card into the slot so that the component parts of the card securely connect to the slot.



Important **If you have trouble installing the card, remove the card once and try again. If you apply excessive pressure on the card, there is a risk of breaking the card.**

7. Close the PCI slot retention latch.
   When it locks, you hear a clicking sound.



8. Assemble the server.
9. Turn on the server and confirm that no error messages are displayed in POST.
   If an error message is displayed, take notes on the message and ask your maintenance service company for maintenance.

1.11.4 Configuration after installing

Depending on the type of card installed, you might need to use a utility (the BIOS setup utility included with this server or a setup utility provided with the card) following installation to modify server settings.

Follow the instructions in the manual provided with the card to specify the correct settings.

After turning the server power on, the PCI bus numbers are scanned in ascending order. If the option ROM installed in the card contains a BIOS utility, the startup message (banner) is displayed in ascending order of the PCI bus numbers.

1.11.5 Removal

Remove a PCI card connected to a PCI slot by using the following procedure.

1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Remove the side cover while referring to *Chapter 2 (1.4 Removing the Side Cover)*.
3. Refer to installation step 4 to open the PCI slot retention.
4. Remove the card.
5. Attach the blank cover, and refer to installation step 7 to close the PCI slot retention.
6. Assemble the server.
7. Turn on the server and confirm that no error messages are displayed in POST.
   If an error message is displayed, take notes on the message and ask your maintenance service company for maintenance.

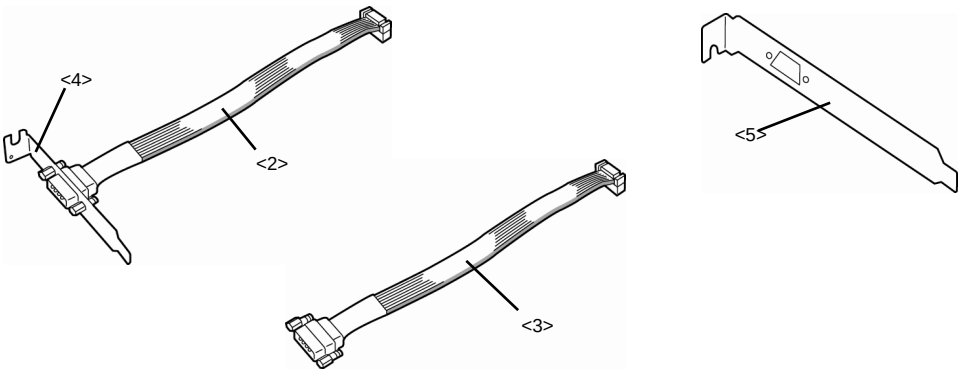
1.11.6 Installing the N8117-01A extra RS-232C connector kit

Install a PCI card to connect to the PCI slot by using the following procedure. For details, refer to the instruction manual supplied with the connector kit.

Important **The N8117-01A extra RS-232C connector kit contains two types of cables. This server uses the RS-232C cable (B).**

The component parts for N8117-01A are as follows:

Item no.	Item name	Specification	Amount	Remarks
<1>	RS-232C connector Kit User's Guide	856-125671-002	1	
<2>	RS-232C cable (A)	804-063264-020	1	
<3>	RS-232C cable (B)	804-062746-820	1	
<4>	PCI bracket (1)	243-112122-001	1	Preinstalled to cable
<5>	PCI bracket (2)	243-112122-002	1	For full height PCI

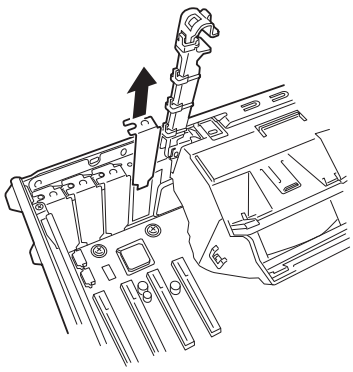


This product uses a combination of items <3> and <4>.

Follow the procedure below to install the kit.

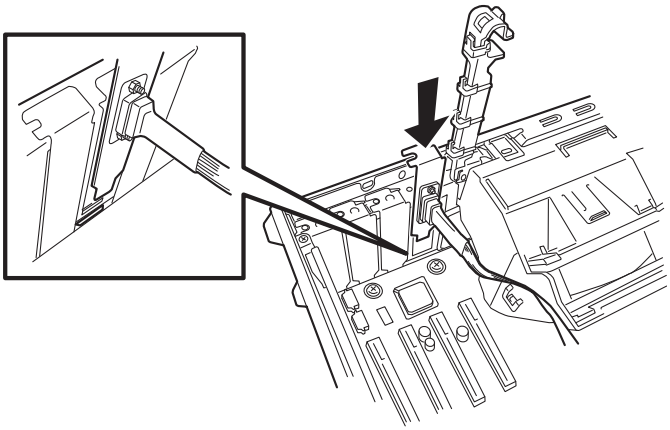
1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Remove the side cover while referring to *Chapter 2 (1.4 Removing the Side Cover)*.
3. Assemble <3> RS-232C cable (B) and <4> PCI bracket (1).
4. Open the PCI slot retention latch while referring to *Chapter 2 (1.11.3 Installation)*.

5. Remove the expansion blank cover aligned with the slot where you are going to install a card.



Important **Keep the removed blank cover for future use.**

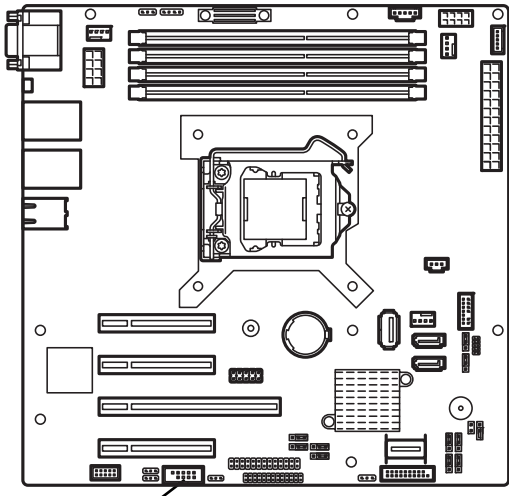
6. Make sure that you are properly inserting the bracket edge into the frame guide, and attach it securely.



7. Arrange the cable so as not to buffer other PCI cards, and connect to the COM connector used for internal connections in the motherboard.
Refer to the following for the position of the COM connector for internal connections.

Important

- **If connecting the cable, fit it to the polarizing key of the connector and be careful not to connect it improperly.**
- **The N8117-01A expansion RS-232C connector kit contains two types of cables. This server uses the RS-232C cable (B).**



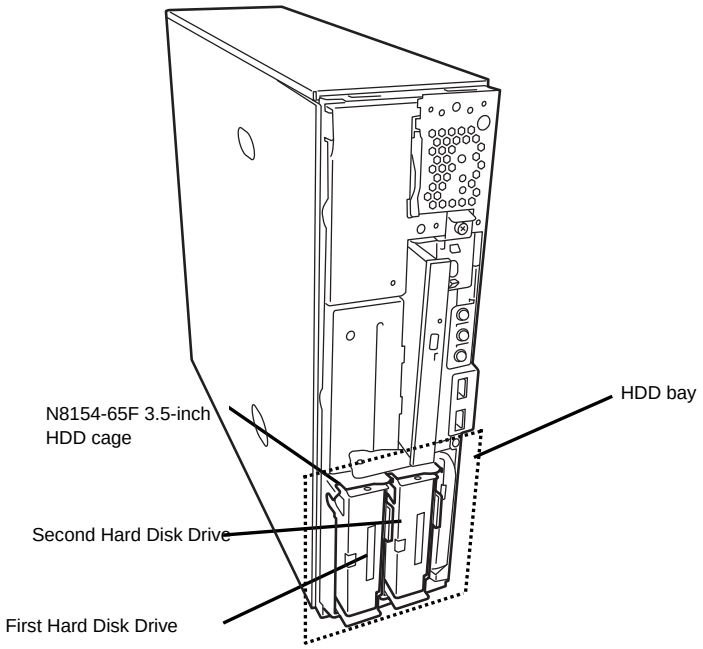
COM connector for internal connections

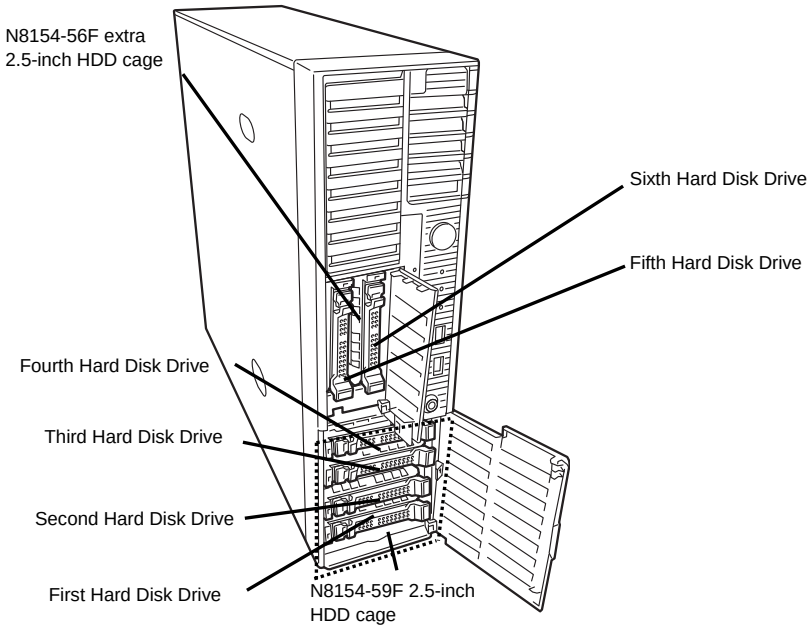
8. Make sure that removed slot covers, tools, screws, or other similar objects do not remain inside before assembling.

1.12 HDD Cages

In the HDD bay in this server, the N8154-65F 3.5-inch HDD cage that can mount up to two 3.5-inch Hard Disk Drives or N8154-59F 2.5-inch HDD cage that can mount up to four 2.5-inch Hard Disk Drives can be installed. In 3.5-inch expansion bay 1, the N8154-56F extra 2.5-inch HDD cage that can mount up to two 2.5-inch Hard Disk Drives can be installed.

Important **Use Hard Disk Drives specified by NEC. Installing a third-party Hard Disk Drive might cause a failure of the server and the Hard Disk Drive. You will be charged for maintenance for failures and damage caused by these products, even during the maintenance period.**

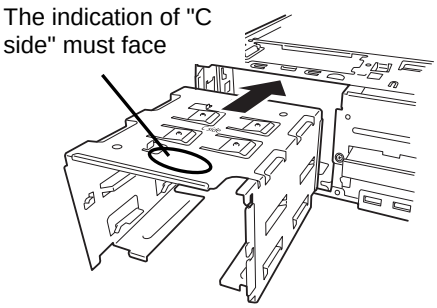




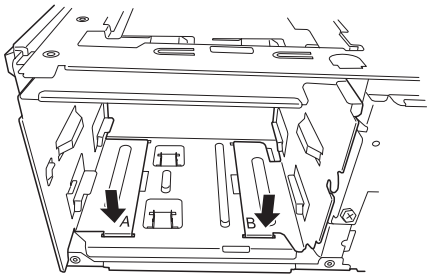
1.12.1 Installing a 3.5-inch HDD cage and hard disk drives

Install a 3.5-inch HDD cage in the server by using the following procedure.

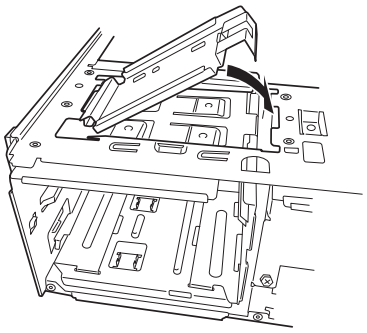
1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Remove the side cover and front bezel by referring to *Chapter 2 (1.4 Removing the Side Cover* and *1.5 Removing the Front Bezel*).
3. Insert the HDD cage into the HDD bay.



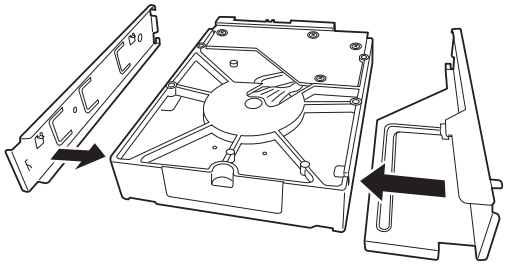
4. Push the HDD cage so that its protrusions A and B come fit into the grooves on the chassis.



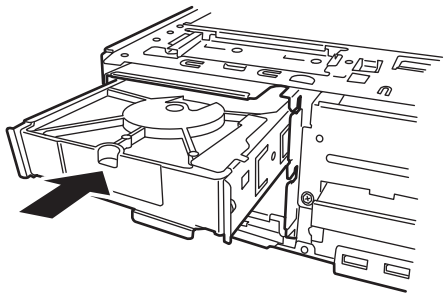
5. Insert one side of the lock plate into the groove of the chassis. Push the lock plate in the direction shown by the arrow to lock the HDD cage.



6. Mount the HDD trays that come with the HDD cage from both sides of the 3.5-inch hard disk drive. Mount the tray marked "A" on the right side, and the tray marked "B" on the left side. Mount the hard disk drive so that its control board faces upward.



7. Insert the hard disk drive attached to the tray into the slot of the HDD cage.
   When it is pushed to the end, it locks with a click.



8. Connect the signal cables and power cable to the hard disk drive. Use the signal cables that come with the HDD cage. Use the power cable connected to the motherboard in advance. For details about cable connection, refer to *1.15.1 Internal interface cables*.
9. Attach the front bezel and side cover you removed in step 2.

1.12.2 Removing hard disk drives

Remove the hard disk drives by using the following procedure.

Important **When disposing of the hard disk drives, follow the instructions described in *Chapter 1* (*1.2 Disposal of consumables and servers*) in the Maintenance Guide.**

1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. While referring to *Chapter 2 (1.4 Removing the Side Cover* and *1.5 Removing the Front Bezel*), remove the side cover and front bezel.
3. Disconnect the power cable and signal cable from the Hard Disk Drives.
4. Press the part shown in the figure to unlock the HDD tray, and then remove the hard disk drive out from the HDD cage.
5. Assemble the server.

1.12.3 Installing a 2.5-inch HDD cage and hard disk drives

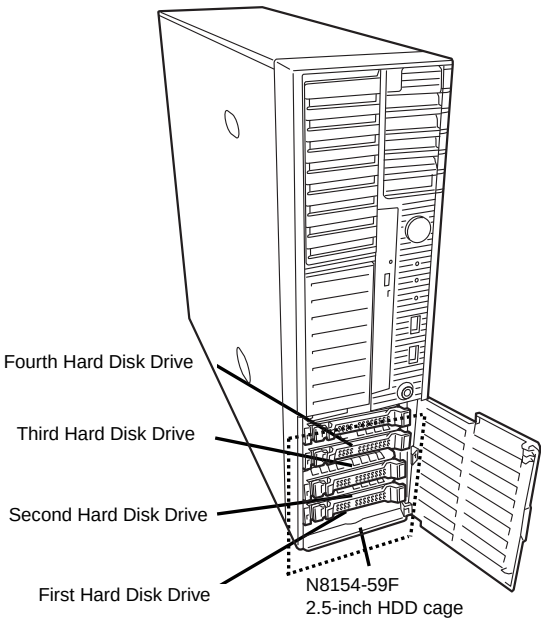
If a 2.5-inch HDD cage is installed in this server, four to six SAS/SATA Hard Disk Drives or SSDs (solid state drive) can be installed.

Combining SATA/SAS Hard Disk Drives and SSDs

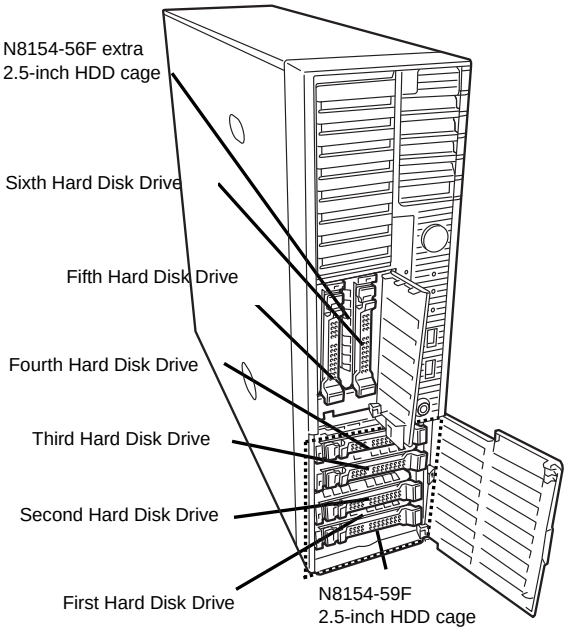
- Hard Disk Drives (SATA/SAS) and SSDs cannot be combined on BTO servers.
- An optional RAID Controller is required to use SAS Hard Disk Drives together with SSDs.
- An optional RAID Controller is required to install five or more Hard Disk Drives.
- You cannot mix them within the same RAID group (pack).
- You cannot use SAS Hard Disk Drives that have different rotation speeds.
- Mount SATA/SAS Hard Disk Drives in order from slot 0, and mount the SSDs to the remaining slots.

The N8154-59F 2.5-inch HDD cage, which is a required BTO option, can mount a SAS HDD, and the N8154-56F 2.5-inch extra HDD cage can mount a SATA HDD, and vice versa.

Important **Use Hard Disk Drives specified by NEC. Installing a third-party Hard Disk Drive might cause a failure of the server and the Hard Disk Drive. You will be charged for maintenance for failures and damage caused by these products, even during the maintenance period.**



(When four Hard Disk Drives are installed)

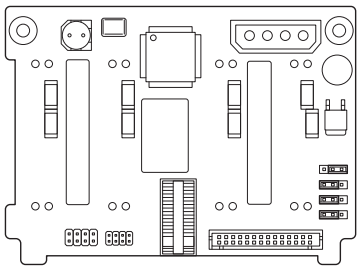


(When six Hard Disk Drives are installed)

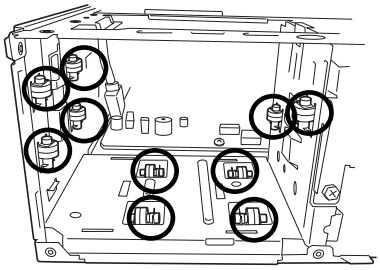
Important **Install the hard disk drives sequentially starting from slot 0.**

Install a 2.5-inch HDD cage in the server by using the following procedure.

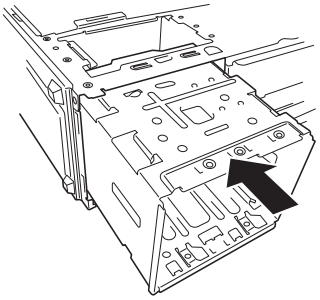
1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. While referring to *Chapter 2 (1.4 Removing the Side Cover* and *1.5 Removing the Front Bezel*, remove the side cover and front bezel.
3. Set the jumper for the backplane board installed in the HDD cage. The jumper setting when the onboard SATA Controller (LSI Embedded MegaRAID) is used differs from that when the optional RAID Controller is used. For details, refer to *1.9 Use of Internal Hard Disk Drives in the RAID System*.

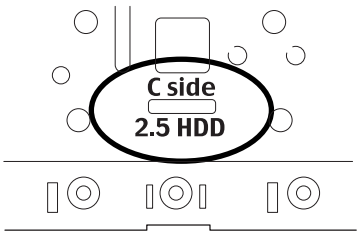


4. Mount the rollers that come with the HDD cage on the grooves inside the HDD bay (10 places).



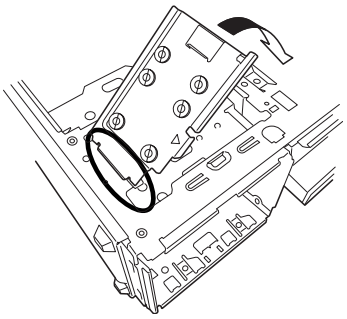
5. Insert the HDD cage into the HDD bay. The indication of "C side" must face upward. Do not push the HDD cage to the end, because you need to connect cables later.





6. Connect the interface cable and power cable to the HDD cage. Use the interface cable that comes with the HDD cage. Use the power cable connected to the motherboard in advance. For details of cable connection, refer to (*2.2.1 Interface cables*) described later.

7. Push the HDD cage to the end. Insert one side of the lock plate into the groove of the chassis. Push the lock plate in the direction shown by the arrow to lock the HDD cage.



1.12.4 Installing an extra 2.5-inch HDD cage

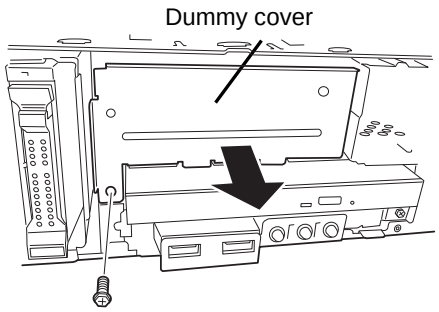
Two hard disks can be added by using an extra 2.5-inch HDD cage.

Tips

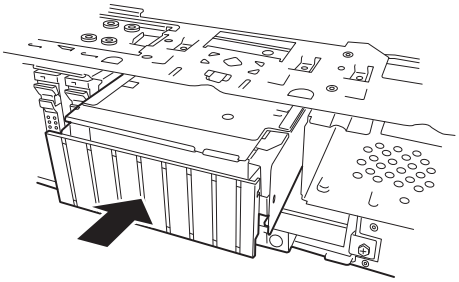
With a liquid-cooled server, an extra 2.5-inch HDD cage cannot be used at the same time as a backup device.

Install an extra 2.5-inch HDD cage in the server by using the following procedure.

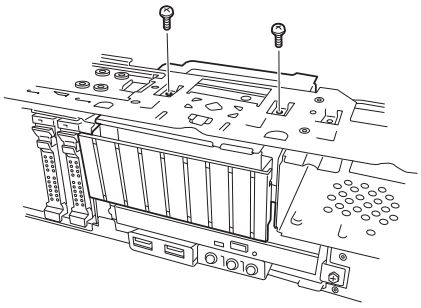
1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. While referring to *Chapter 2 (1.4 Removing the Side Cover* and *1.5 Removing the Front Bezel*, remove the side cover and front bezel.
3. Remove one screw and the dummy cover from the 3.5-inch device bay.



4. Insert an extra 2.5-inch HDD cage into the 3.5-inch device bay. Do not push the HDD cage to the end, because you need to connect cables later.

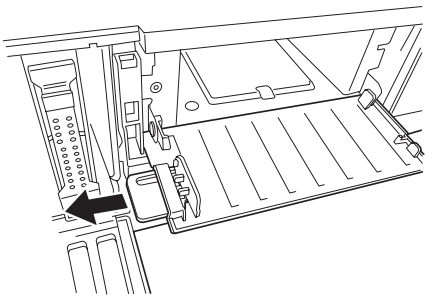


5. Connect the interface cable that comes with the HDD cage and the power cable on the motherboard. For details, refer to *Chapter 2* (*1.15 Connecting cables*).
6. Push the HDD cage to the end and secure it with two screws.



7. Attach the front bezel and side cover.

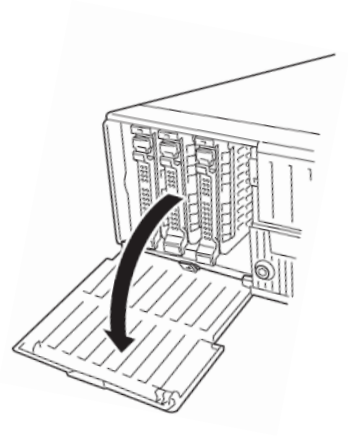
8. Open the front door of the standard 2.5-inch HDD cage. Slide the tab on the bezel of the extra 2.5-inch HDD cage in the direction shown by the arrow, and then remove it from the bezel. Sliding this tab toward the outside of the bezel allows you to lock the bezel of the extra 2.5-inch HDD cage when the front door of the standard 2.5-inch HDD cage is closed.



1.12.5 How to open the extra 2.5-inch HDD cage door

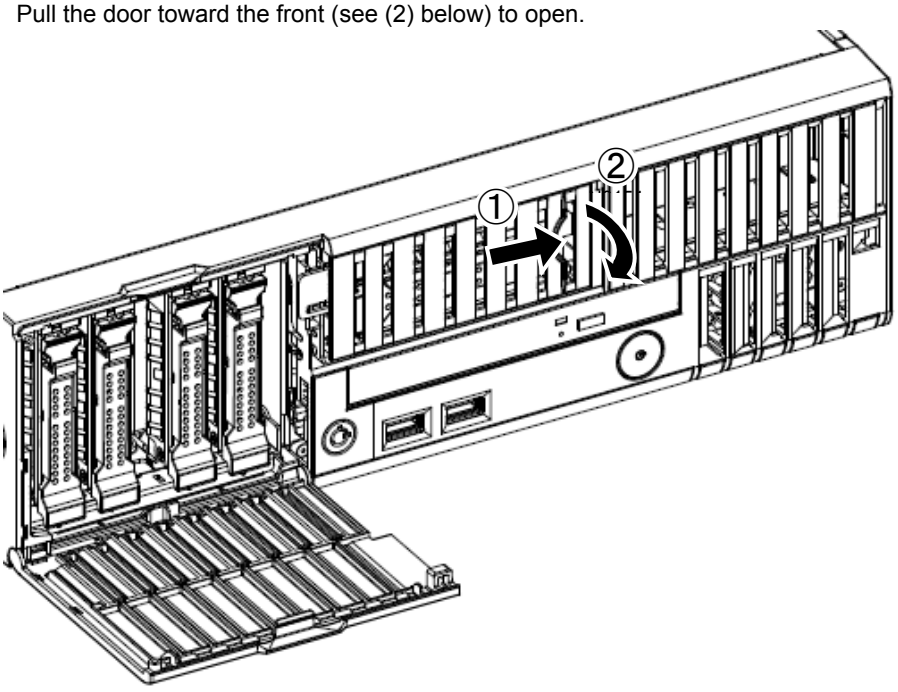
Open the extra 2.5-inch HDD cage in the server by using the following procedure.

1. Unlock and open the door of the 2.5-inch hard disk drive bay.



Note You need to open the 2.5-inch HDD bay door first to open the extra 2.5-inch HDD cage door.

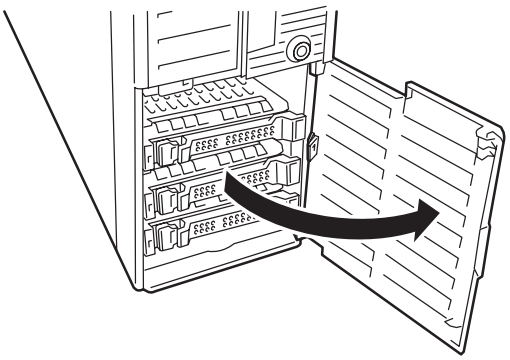
2. Insert your finger into the opening located on the right side of the extra 2.5-inch HDD cage door (if the server is laid down horizontally) and push the door to the right (see (1) below) to unlock the door. Pull the door toward the front (see (2) below) to open.



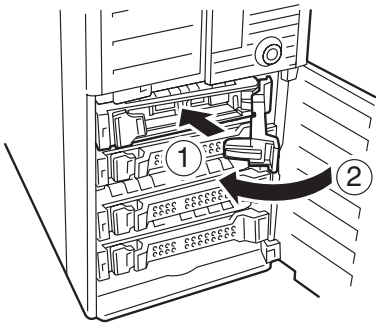
1.12.6 Installing the hard disk drive

Install a 2.5-inch Hard Disk Drive in the server by using the following procedure.

1. Unlock and open the door of the 2.5-inch drive bay.



2. Install the hard disk drives in the HDD cage.
   Fully open the lever on the hard disk drive tray, and then insert the hard disk drive until it comes into contact with back of the HDD cage (1).
   When finished, close the lever to lock the hard disk drive (2). (You will hear a click.)



Important **Use only the hard disk drives recommended by NEC.**
Ask your sales agent or service representative for details.

Note Make sure that the orientation of the hard disk drive (tray) before insertion (see the figure) is correct. In addition, make sure that the hook of the lever engages with the frame of the HDD cage when the lever is closed.

Important **If you remove two or more hard disk drives while the server is on, the logical drive will be damaged. Remove or replace the hard disk drives one by one.**

3. Close the door and lock it by using the key.

1.13 Optical Disk Drive

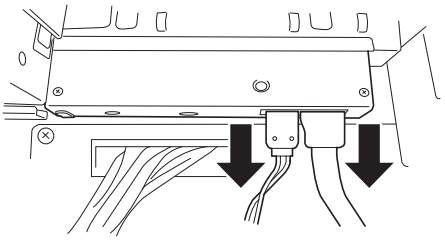
Procedures for replacing the standard optical disk drive with the optional internal DVD SuperMULTI drive are described below.

Important **Do not install a drive other than those specified by NEC.**

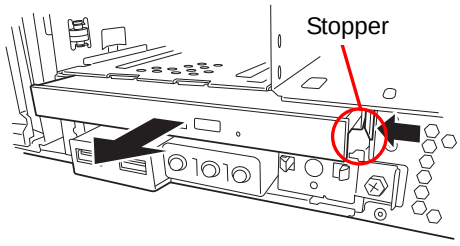
1.13.1 Replacing drives

Follow the procedure below to replace your drive with the optional internal DVD SuperMULTI drive.

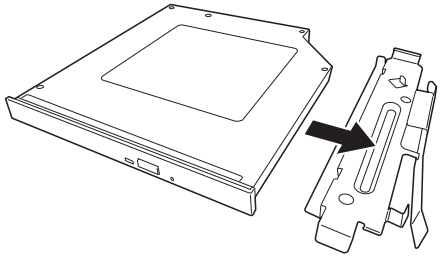
1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Remove the side cover and front bezel while referring to *Chapter 2 (1.4 Removing the Side Cover* and *1.5 Removing the Front Bezel)*.
3. If a device or an extra 2.5-inch HDD cage is installed in the 3.5-inch device bay (1), remove it so that you can access the cable connected to the optical disk drive.
4. Disconnect the SATA cable and DC power cable from the optical disk drive.



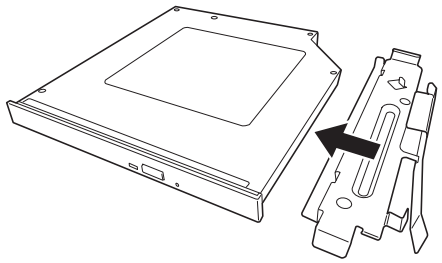
5. Push the stopper on the right side (as viewed from the front) and remove the optical disk drive.



6. Remove the bracket from the optical disk drive.



7. Mount the bracket for the optical disk drive on the DVD SuperMULTI drive.



8. Install the bracket with DVD SuperMULTI drive installed to the server.

9. Connect the SATA cable and DC power cable you disconnected in step 3 to the server.

This completes the installation procedures.

1.13.2 Removal

You can remove the optical disk drive by reversing the installation procedure.

1.14 Backup devices

The 3.5-inch device bay of the server can contain a backup device such as a magnetic tape drive. In an air cooled server, install the backup device in 3.5-inch device bay 2. In a liquid-cooled server, install the backup device in 3.5-inch device bay 1.

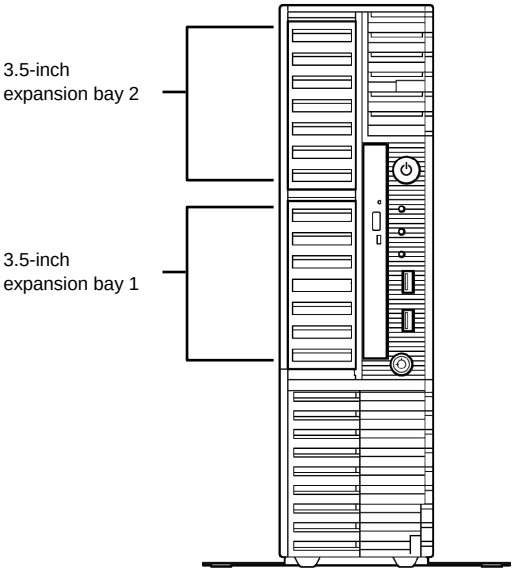
Tips

An optional internal USB cable is required to install a backup device.

- K410-276(00) internal USB cable (USB 3.0)
- K410-286(00) internal USB cable (USB 2.0)

Prepare whichever cable is appropriate for your configuration.

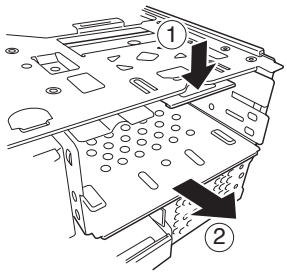
In a liquid-cooled server, the backup device cannot be used at the same time as an extra 2.5-inch HDD cage.



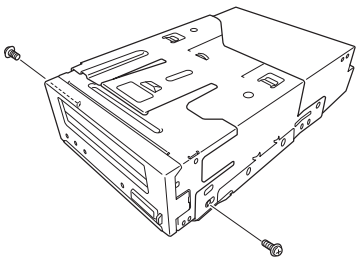
1.14.1 Installation

Install a backup device by using the following procedure.

1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Remove the side cover and front bezel while referring to *Chapter 2 (1.4 Removing the Side Cover* and *1.5 Removing the Front Bezel)*.
3. Remove the blank cover. Push the tab on the tray and pull out the device tray from the 3.5-inch device bay.



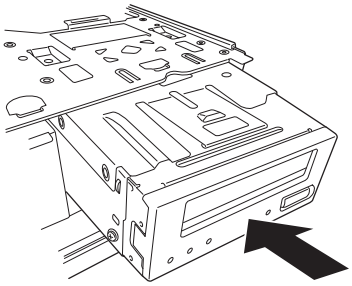
4. Mount the backup device on the device tray. Secure the backup device on the left and right sides by using the two screws that come with the server.



Important **Use screw set 502 supplied with this server to attach the backup device to the tray.**

5. Insert the backup device into chassis.

   Do not push the backup device in completely as the cable has to be connected to the device.



6. Connect the interface cable and power cable to the installed 3.5-inch backup device.

   For more information, refer to *Chapter 2* (*1.15 Connecting cables)*.
7. Push the device all the way until it locks with a clicking sound.
8. Assemble the server.
9. Install device drivers for installed backup device as needed.

   For more information, refer to the manual provided with the backup device.

1.14.2 Removal

You can remove the backup device by reversing the installation procedure. If the devices are to remain removed, attach the stored dummy cover.

1.15 Connecting cables

This section shows an example of internal device cable connection.

1.15.1 Internal interface cables

This section describes the connection of internal interface cables.

Tips The figure shown here primarily describes connections. For more information about the connectors on the motherboard, refer to *Chapter 1 (5.4 Motherboard)*.

(1) Connecting Hard Disk Drives

This section describes how to connect additional Hard Disk Drives.

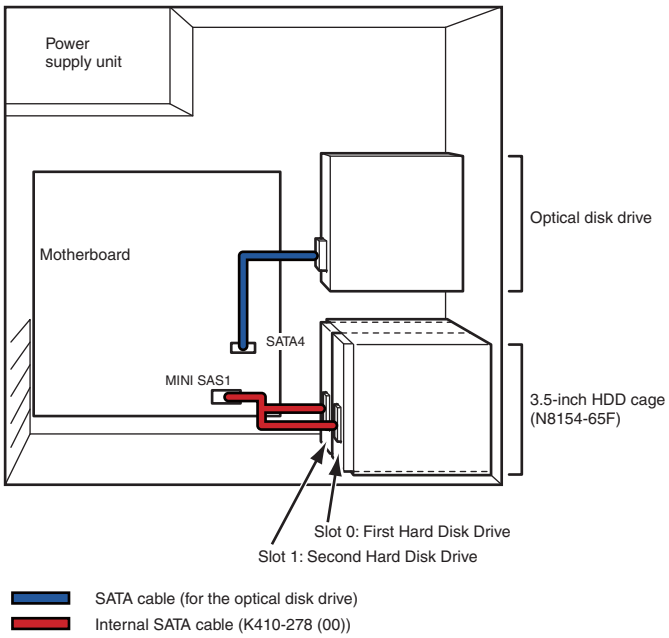
(a) In case of 3.5-inch Hard Disk Drive installed

When adding 3.5-inch Hard Disk Drives, connect the cables as in the following figure. Install the Hard Disk Drives in order from the left side.

Connect the first Hard Disk Drive to SATA0, the second to SATA1.

- **When connecting to the miniSAS connector on the motherboard**

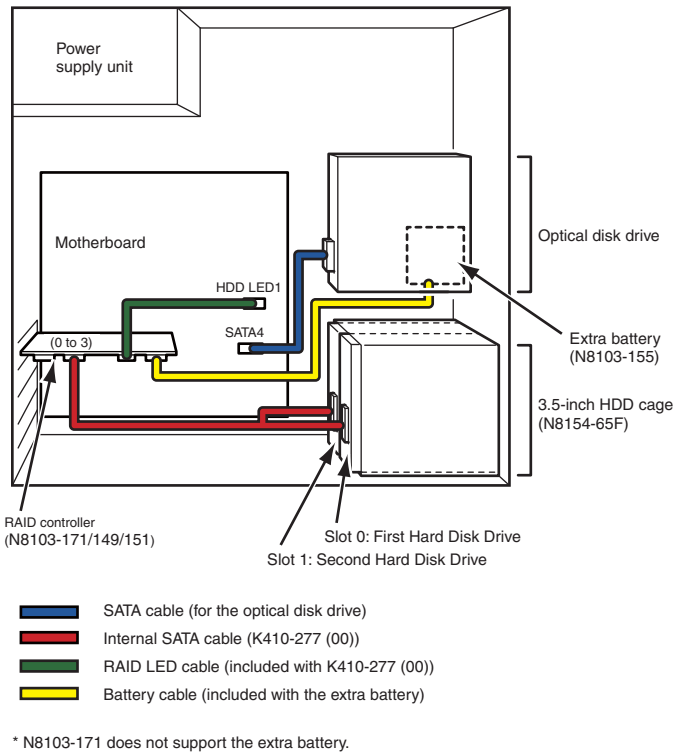
A dedicated cable (K410-278(00)) is required.



You can use the controller on the motherboard to build a RAID System. For more information on the RAID level you can build and then method for building RAID Systems, see *Chapter 2 (4. RAID System Configuration)* in "*Maintenance Guide*".

- **If a RAID Controller (N8103-171/149) has been added**

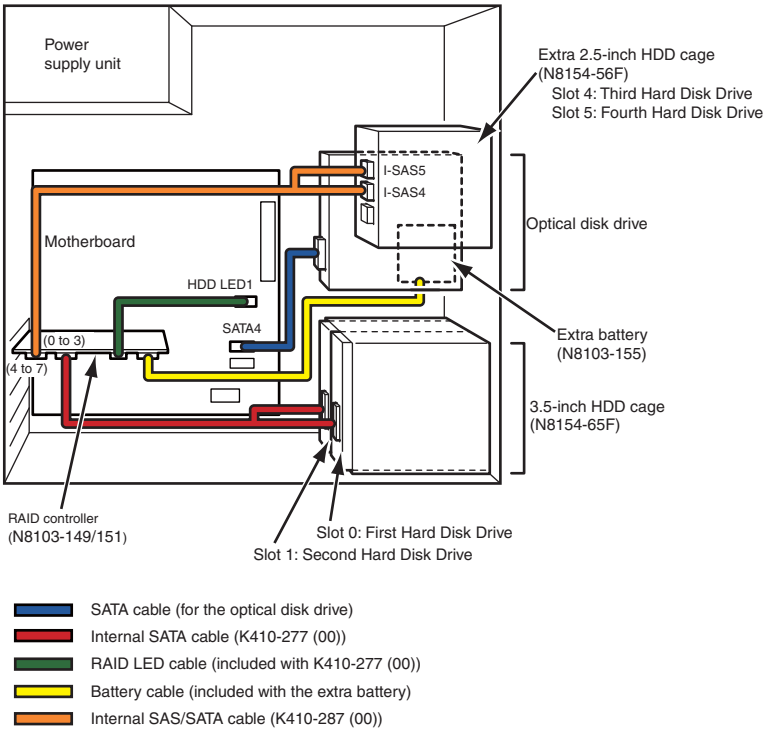
  Connecting to a RAID Controller (N8103-171/149) requires a dedicated cable (K410-277(00)) for use with RAID Controllers. Install the Hard Disk Drives in order from the left side.


Power supply unit
Motherboard
HDD LED1
SATA4
(0 to 3)
Optical disk drive
Extra battery (N8103-155)
3.5-inch HDD cage (N8154-65F)
RAID controller (N8103-171/149/151)
Slot 0: First Hard Disk Drive
Slot 1: Second Hard Disk Drive
SATA cable (for the optical disk drive)
Internal SATA cable (K410-277 (00))
RAID LED cable (included with K410-277 (00))
Battery cable (included with the extra battery)

* N8103-171 does not support the extra battery.

- **When a RAID Controller (N8103-149) is installed and an extra 2.5-inch HDD cage (N8154-56F) is connected:**

When a RAID Controller (N8103-149) is installed and an extra 2.5-inch HDD cage (N8154-56F) is connected, dedicated cables (K410-277(00) and K410-287(00)) are required. Do not use the cable that comes with the extra 2.5-inch HDD cage (N8154-56F). Install the hard disk drives sequentially starting from the leftmost slot when viewed from the front.

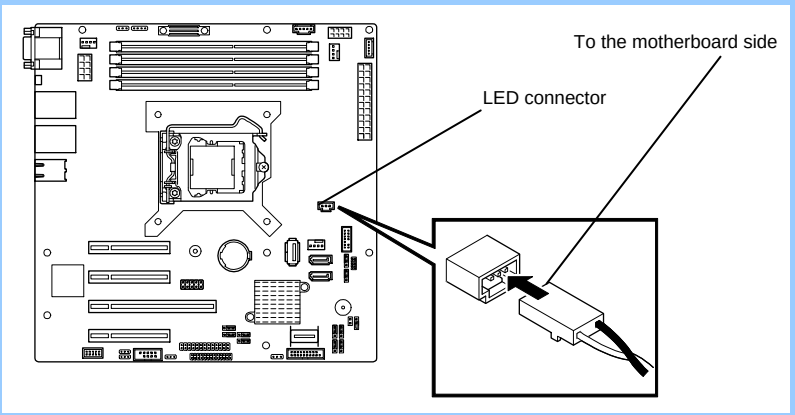

Power supply unit
Extra 2.5-inch HDD cage (N8154-56F)
Slot 4: Third Hard Disk Drive
Slot 5: Fourth Hard Disk Drive
I-SAS5
I-SAS4
Optical disk drive
Motherboard
HDD LED1
SATA4
(0 to 3)
(4 to 7)
Extra battery (N8103-155)
3.5-inch HDD cage (N8154-65F)
RAID controller (N8103-149/151)
Slot 0: First Hard Disk Drive
Slot 1: Second Hard Disk Drive
SATA cable (for the optical disk drive)
Internal SATA cable (K410-277 (00))
RAID LED cable (included with K410-277 (00))
Battery cable (included with the extra battery)
Internal SAS/SATA cable (K410-287 (00))

Tips Dedicated cables (K410-277(00) and K410-287(00)) are required for connection. Do not use the cable that comes with the extra 2.5-inch HDD cage (N8154-56F)

Important

- **About RAID LED cables**

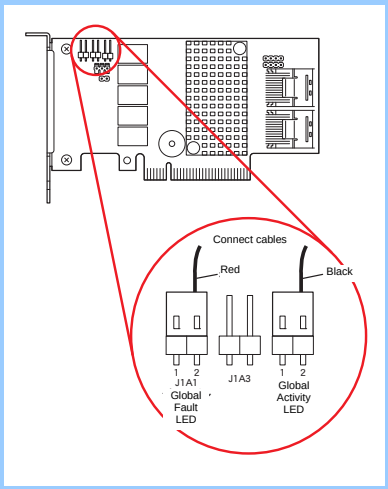
  The DISK access LED on the front of the equipment shows the access status of Hard Disk Drives that are connected to a RAID Controller. To display this status, connect the LED cable that comes with the optional K cord cable K410-277(00). Connect the LED connector on the motherboard to the connector on the RAID Controller.



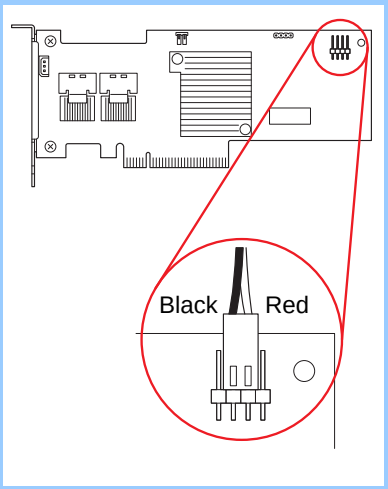
Refer to the figures below and connect the LED cable to the LED connector of the motherboard.

Connect the opposite end of the cable to connect to the RAID Controller.

RAID Controller N8103-149



RAID Controller N8103-171

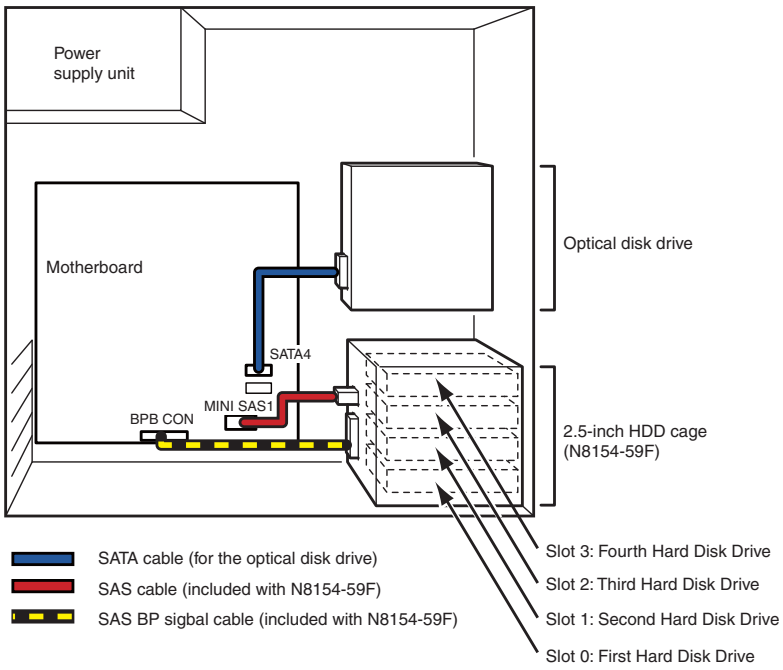


(b) In case of 3.5-inch Hard Disk Drive installed

When adding 3.5-inch Hard Disk Drives, connect the cables as in the following figure. Install the Hard Disk Drives in order from slot 0.

- **When connecting to the miniSAS connector on the motherboard:**

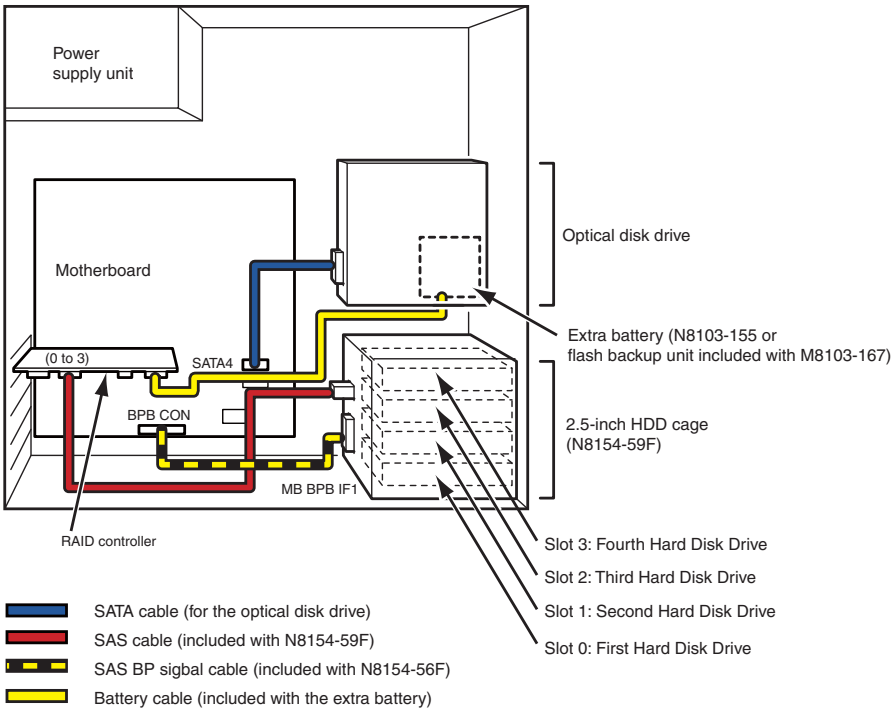
  Use the cable that comes with the 2.5-inch HDD cage N8154-59F.
  Install Hard Disk Drives from Slot 0 in ascending order.


Power supply unit
Motherboard
Optical disk drive
SATA4
MINI SAS1
BPB CON
2.5-inch HDD cage (N8154-59F)
SATA cable (for the optical disk drive)
SAS cable (included with N8154-59F)
SAS BP sigbal cable (included with N8154-59F)
Slot 3: Fourth Hard Disk Drive
Slot 2: Third Hard Disk Drive
Slot 1: Second Hard Disk Drive
Slot 0: First Hard Disk Drive

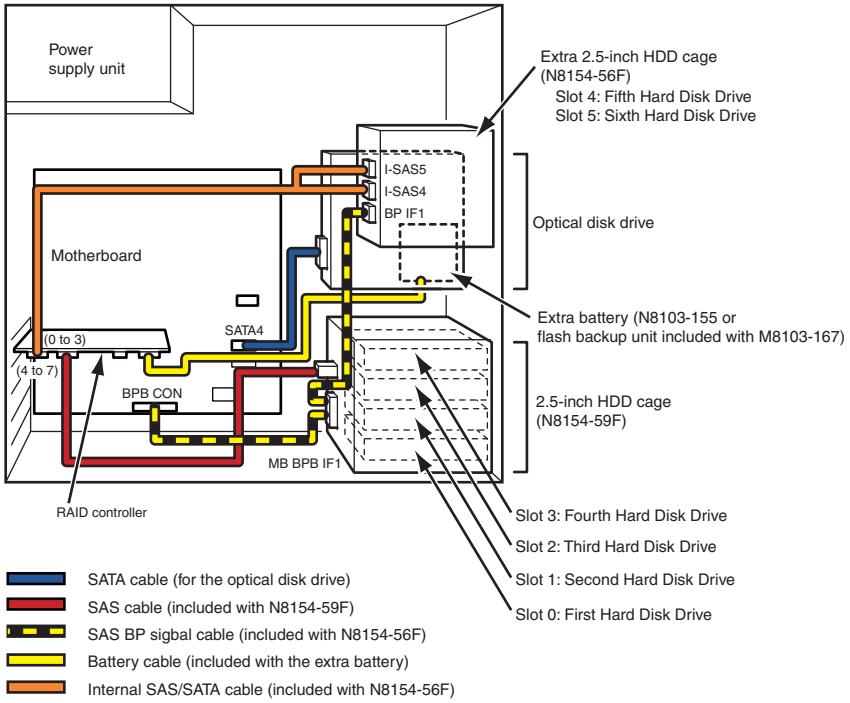
- **If a RAID Controller (N8103-171/149/150/151/167) has been added**

  If SAS or SATA Hard Disk Drives are installed and used in a RAID System with a RAID Controller (N8103-128/149/150/151), the dedicated cable K410-180(00) is required. Install Hard Disk Drives from Slot 0 in ascending order.

  (When four Hard Disk Drives are installed)


Power supply unit
Motherboard
(0 to 3)
SATA4
BPB CON
MB BPB IF1
RAID controller
Optical disk drive
Extra battery (N8103-155 or flash backup unit included with M8103-167)
2.5-inch HDD cage (N8154-59F)
Slot 3: Fourth Hard Disk Drive
Slot 2: Third Hard Disk Drive
Slot 1: Second Hard Disk Drive
Slot 0: First Hard Disk Drive
SATA cable (for the optical disk drive)
SAS cable (included with N8154-59F)
SAS BP sigbal cable (included with N8154-56F)
Battery cable (included with the extra battery)

  * N8103-171 does not support the extra battery.


Power supply unit
Extra 2.5-inch HDD cage (N8154-56F)
Slot 4: Fifth Hard Disk Drive
Slot 5: Sixth Hard Disk Drive
I-SAS5
I-SAS4
BP IF1
Optical disk drive
Motherboard
Extra battery (N8103-155 or flash backup unit included with M8103-167)
SATA4
(0 to 3)
(4 to 7)
BPB CON
2.5-inch HDD cage (N8154-59F)
MB BPB IF1
RAID controller
Slot 3: Fourth Hard Disk Drive
Slot 2: Third Hard Disk Drive
Slot 1: Second Hard Disk Drive
Slot 0: First Hard Disk Drive
SATA cable (for the optical disk drive)
SAS cable (included with N8154-59F)
SAS BP sigbal cable (included with N8154-56F)
Battery cable (included with the extra battery)
Internal SAS/SATA cable (included with N8154-56F)

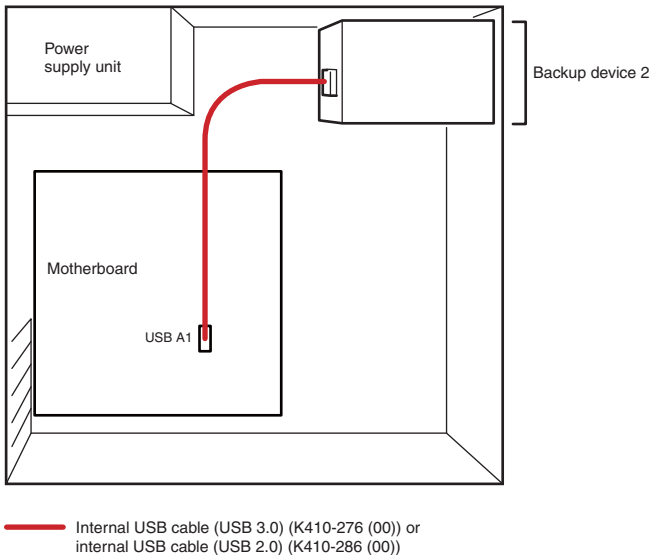
* N8103-171 does not support the extra battery.

(2) Connecting backup devices

The 3.5-inch device bay of the server can mount USB devices (for internal connection).

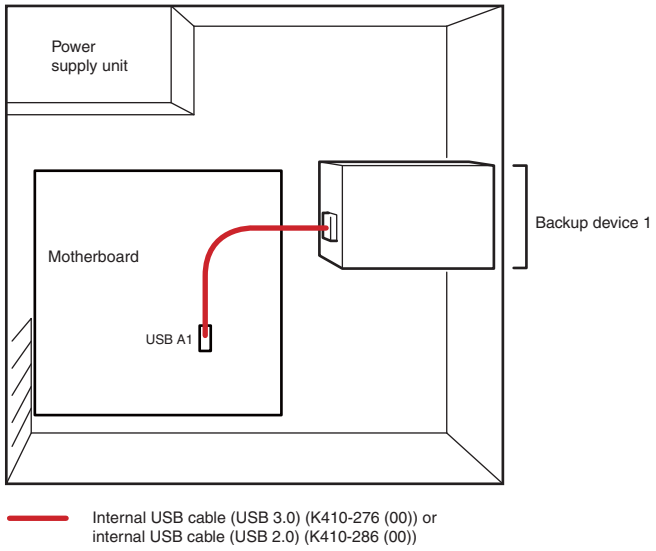
(a) If mounting an internal USB device (In case of Air Cooling model)

Use the dedicated internal USB cable (for USB 3.0: K410-276(00), for USB 2.0: K410-286(00).



(b) If mounting an internal USB device (In case of Liquid Cooling model)

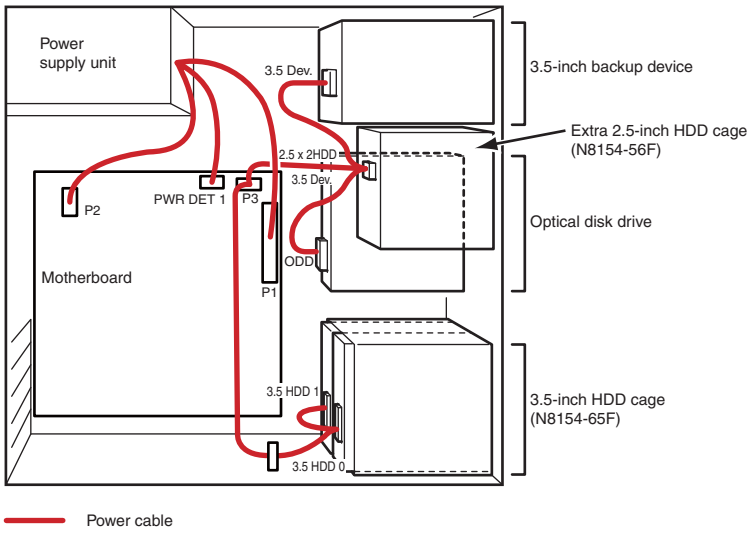
Use the dedicated internal USB cable (for USB 3.0: K410-276(00), for USB 2.0: K410-286(00).



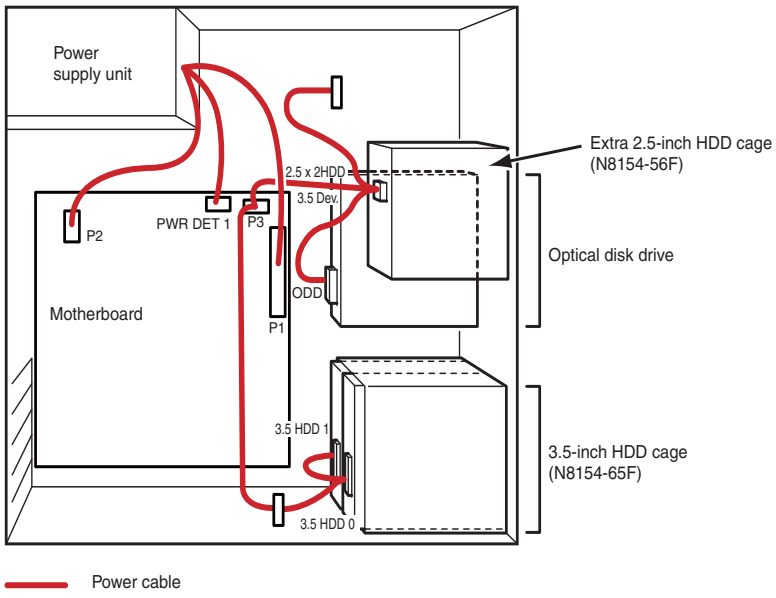
1.15.2 Power cables

The illustration below shows an example of connecting the power cables. Power cables other than those shown here are not used by the devices.

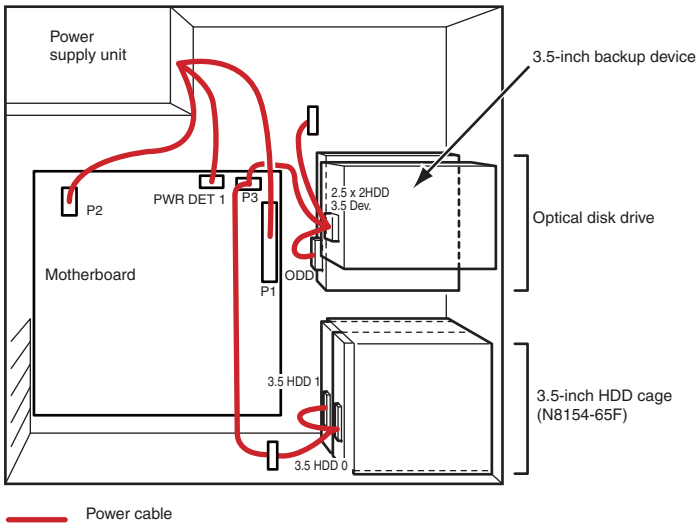
(1) When using 3.5-inch Hard Disk Drives in air cooling model and an extra 2.5-inch HDD cage and a backup device are installed



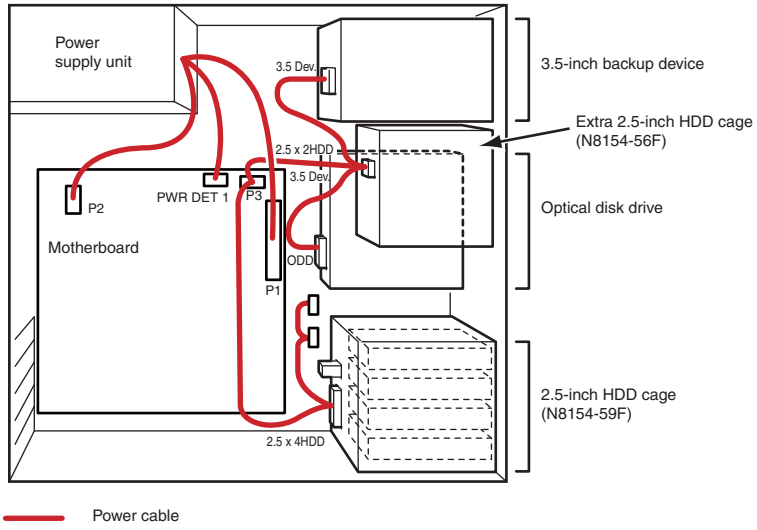
(2) When using 3.5-inch Hard Disk Drives in liquid cooling model and an extra 2.5-inch HDD cage is installed



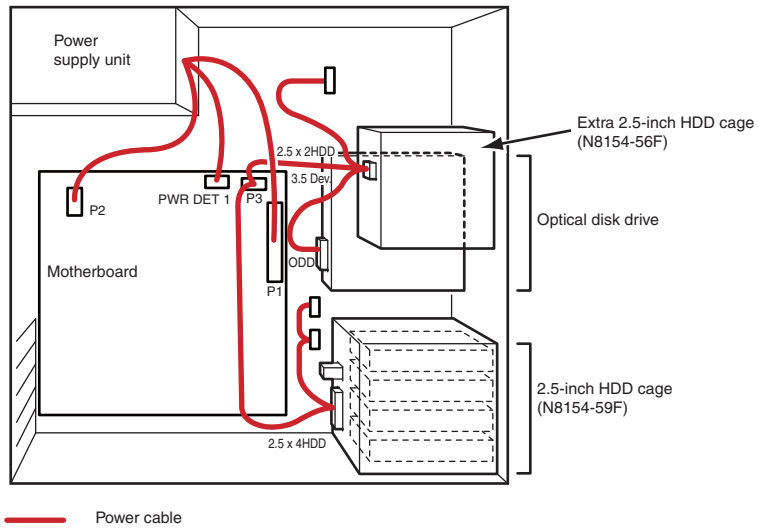
(3) 3.5-inch Hard Disk Drives in liquid cooling model and a backup device is installed



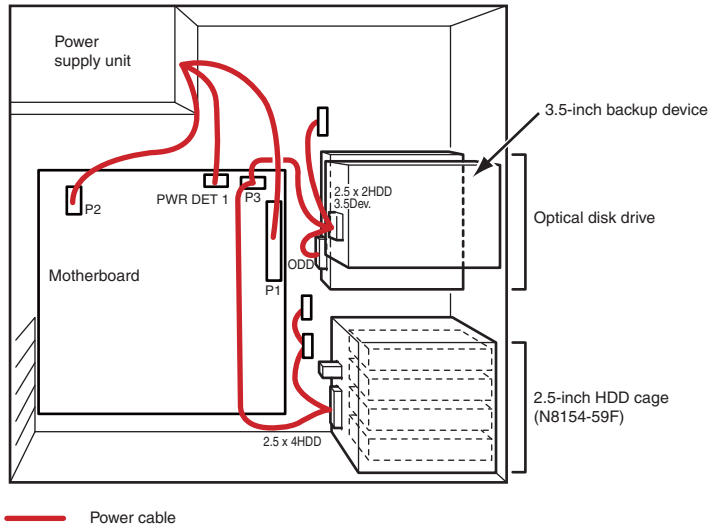
(4) When using 2.5-inch Hard Disk Drives in air cooling model and an extra 2.5-inch HDD cage and a backup device are installed



(5) When using 2.5-inch Hard Disk Drives in liquid cooling model and an extra 2.5-inch HDD cage is installed

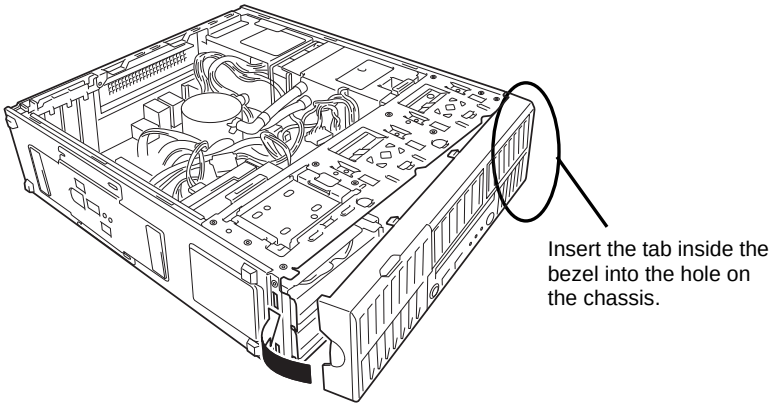


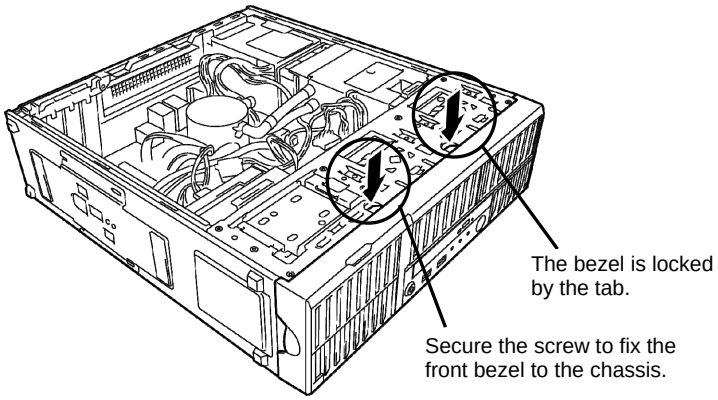
(6) When using 2.5-inch Hard Disk Drives in liquid cooling model and a 3.5-inch backup device are installed



1.16 Attaching the Front Bezel

You can attach the front bezel by reversing the removal procedure. Insert the tab inside the front bezel into the hole on the front upper side of the server, push the left side of the front bezel toward the server, and then lock the bezel by using the tab on the upper side of the bezel. Secure the screw to fix the bezel onto the chassis.





1.17 Installing the Side Cover

You can attach the side cover by reversing the removal procedure.

Make sure that hooks at both the top and bottom of the side cover are securely inserted in the holes on the server frame. Also make sure that the hooks at the front of the cover are engaged with the server frame when sliding the side cover forward to attach. If they are not engaged with the frame, the cover cannot be secured in place.

2. Installation and Connection

This section describes how to position the server and connect cables.

2.1 Installation

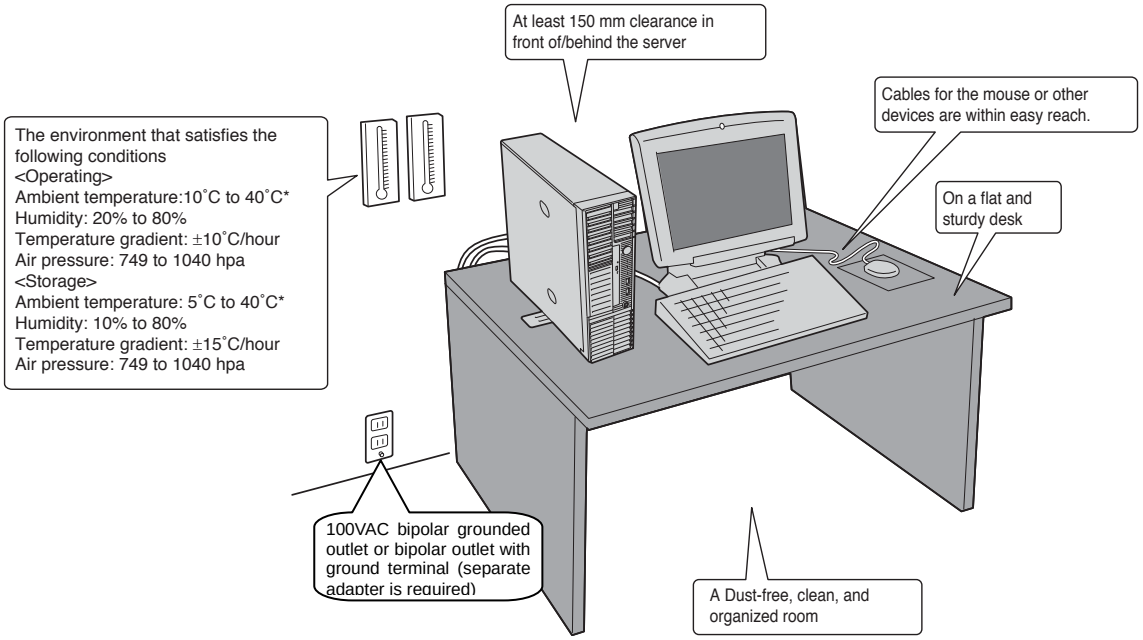
CAUTION

Be sure to observe the following precautions to use of the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to *Safety precautions* in *Precautions for Use.*

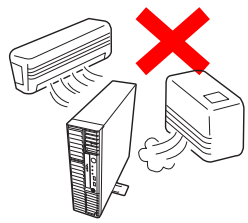
- **Do not attempt to lift the server by gripping the front bezel or vent holes cover.**
- **Install and store only in the specified environment.**

The environment suitable for the server is as follows.

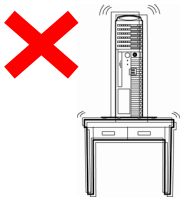
Hold the server firmly, and slowly and gently place it in the position in which it is to be installed.


At least 150 mm clearance in front of/behind the server
Cables for the mouse or other devices are within easy reach.
On a flat and sturdy desk
The environment that satisfies the following conditions
<Operating>
Ambient temperature:10˚C to 40˚C*
Humidity: 20% to 80%
Temperature gradient: ±10˚C/hour
Air pressure: 749 to 1040 hpa
<Storage>
Ambient temperature: 5˚C to 40˚C*
Humidity: 10% to 80%
Temperature gradient: ±15˚C/hour
Air pressure: 749 to 1040 hpa
100VAC bipolar grounded outlet or bipolar outlet with ground terminal (separate adapter is required)
A Dust-free, clean, and organized room

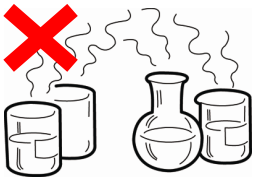
Do not install the server in an environment in which any of the following conditions apply: Installing the server in any of the following conditions will cause the server to malfunction.



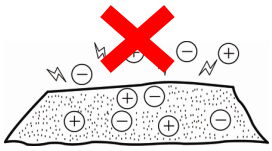
Place of drastic temperature change (near a heater, air conditioner, or refrigerator).



Place where intense vibration may be generated.

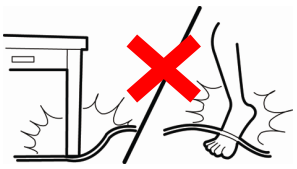


Places where corrosive gas is present (environments where there is sulfur vapor in the atmosphere), or places where chemicals are nearby or may be accidentally sprayed over.

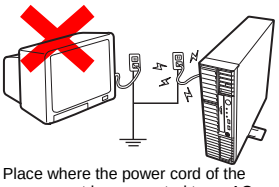


Place where a carpet not subject to anti-static process is laid.

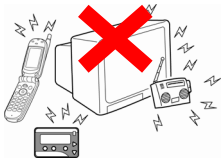
Place where some objects may be fallen.



Places where the power cords or interface cables might be stepped on or tripped over.



Place where the power cord of the server must be connected to an AC outlet that shares the ground wire with another outlet where another device with large power consumption is connected.



Place near a device generating intense magnetic field (such as TVs, radios, broadcast/communication antennas, power transmission wires, and electromagnetic cranes) is placed.

Do not install where there is power supply noise nearby (such as contact sparks when turning power on or off during power relays). (If you must install the server close to such equipment, have your maintenance service company separate power cables or install noise filter.)

2.1.1 Preparation for installation

(1) For vertical mounting

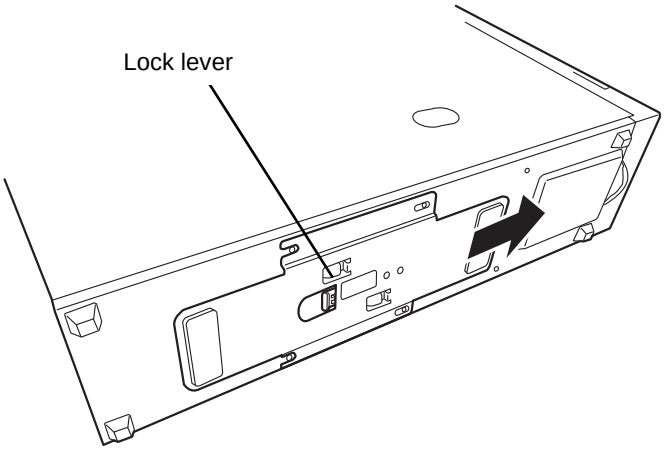
For vertical use of the server, the stabilizer attached to the bottom of the server must be removed to change the orientation as instructed below.

Also be sure to attach the vent holes cover for cooling on the top of the server.

Removing/installing the stabilizer

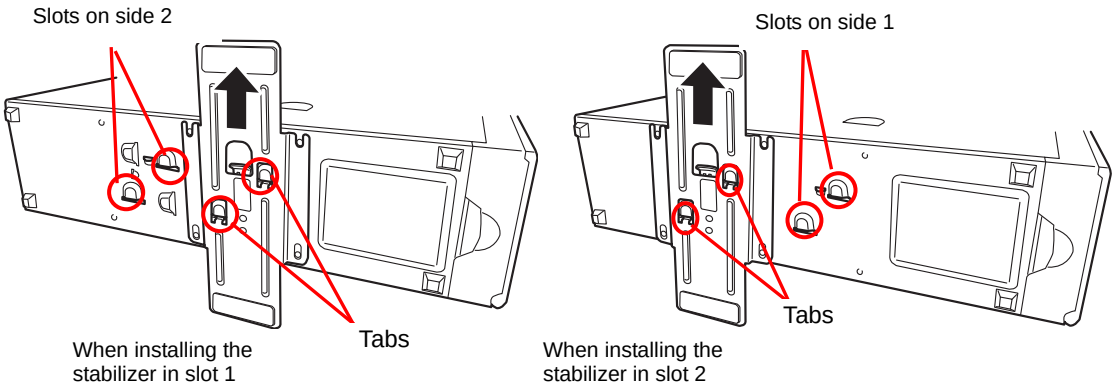
Removing the stabilizer

Release the lock lever and slide it in the direction of the arrow to remove.

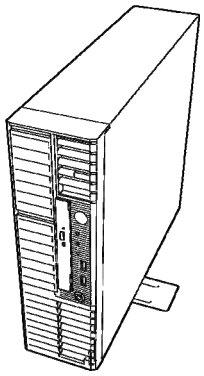


Installing the stabilizer

Insert the tab of the stabilizer into the slot of the server as shown in the image below.

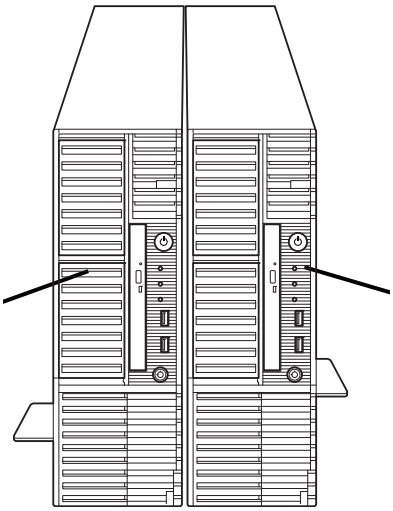

Slots on side 2
Tabs
When installing the stabilizer in slot 1
Slots on side 1
Tabs
When installing the stabilizer in slot 2

After attaching the stabilizers, set up the server as shown in the image.



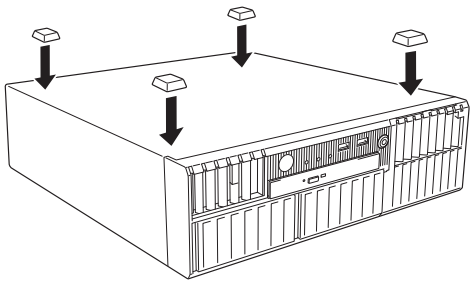
Tips

When two or more servers are installed vertically side by side, installing the stabilizers in slots 1 and 2 alternately can remove the gap between servers.



(2) For horizontal mounting

To mount the server horizontally, attach the provided rubber feet to the positions shown in the image.



Attach the rubber feet on the right side of the server as shown in the image.

Important

If the server is horizontally mounted, you may put devices that weigh less than 5 kg on the top of the server.

2.2 Connection

Connect peripheral devices to the server. Connectors that allow a variety of peripheral devices to be connected are provided at the front and rear of the server. Images on the following pages show the peripheral devices that can be connected in their standard state and their respective connector positions. First connect the peripheral devices and then connect the power cord to the server. After that, connect the power plug to the outlet.

WARNING

Be sure to observe the following precautions to use the server safety. Failure to observe the precautions may cause death or serious injury. For details, refer to *Safety precautions* in *Precautions for Use*.

- **Do not hold the power plug with wet hands.**

CAUTION

Be sure to observe the following precautions to use of the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to *Safety precautions* in *Precautions for Use.*

- **Use only the specified outlet to insert.**
- **Do not connect the power cord to an outlet that has an illegal number of connections.**
- **Insert the power plug into the outlet as far as it goes.**
- **Use only the specified power cord.**
- **Do not connect or disconnect the interface cable while the power cord is connected.**
- **Use only the specified interface cable.**

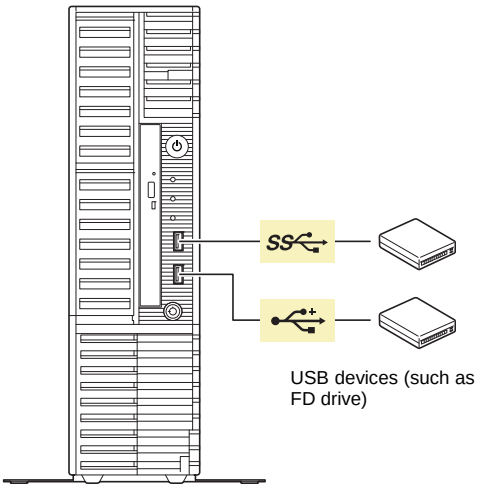
2.2.1 Interface cables

First connect the interface cable and then the power cord.

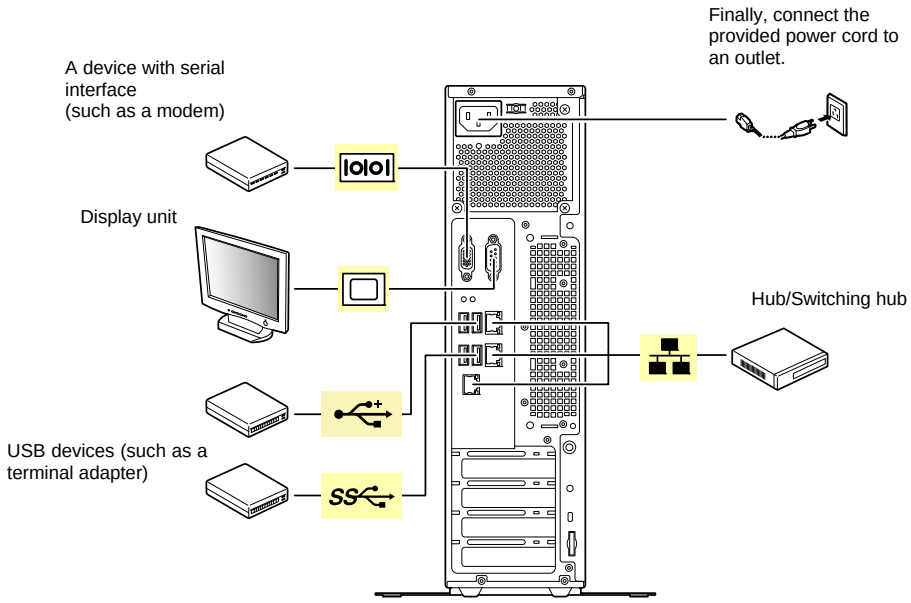
Important

- **Turn off the server and peripheral devices to be connected before connecting. Connecting wit power ON can cause malfunction or failure.**
- **If connecting any peripheral device and its interface cable made by a third party, contact the store where you purchased them to check if they can be used with the server beforehand. Some devices from a third party cannot be used with the server.**
- **You cannot connect directly to the dedicated line through the serial port that is equipped with the server as standard. To connect the dedicated line, use a terminal device that is certified according to the Telecommunication Business Law (a dedicated line means a dedicated communication facility or other facility allocated to one specific user). It includes a public line.)**
- **The connectors that are not explained here are not used. Do not connect anything to the connectors.**
- **Be sure to use the display unit specified by NEC. The operation is not guaranteed if you install a display unit not specified by NEC.**

<Front view>

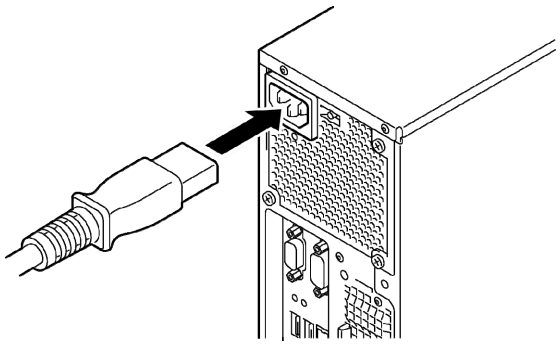


<Rear view>


Finally, connect the provided power cord to an outlet.
A device with serial interface (such as a modem)
Display unit
Hub/Switching hub
USB devices (such as a terminal adapter)

2.2.2 Power cord

Connect the provided power cord to the server.



Tips

- To connect the power cord to a UPS, connect it to the outlet provided at the rear of the UPS.
  For details, refer to the instruction manual supplied with the UPS
- In order to link the power supply from the UPS with the power-on/off of this server, the BIOS settings change might be required depending on the UPS to which the power cord of this server is connected.
  In the BIOS Setup Utility, select **Server**, and then **AC-LINK** to change the parameter to the appropriate value.

NEC Express5800 Series
Express5800/T110f-S

3 Setup

This chapter describes how to set up the server.

1. **Turning on the Server**
   POST (Power-On Self-Test) is explained in this section.

2. **System BIOS Setup**
   You can customize BIOS settings by following the instructions in this section.

3. **EXPRESSSCOPE Engine 3**
   EXPRESSSCOPE Engine 3 provides useful features through the Baseboard Management Controller (BMC).

4. **EXPRESSBUILDER**
   EXPRESSBUILDER helps you to install Windows and maintain the server.

5. **Installing Software Components**
   You can install Windows and bundled software by following the instructions in "*Installation Guide (Windows)*".

6. **Turning off the Server**
   Turn off power when not using the server.

1. Turning on the Server

Turn on the server by using the following procedure.

Important

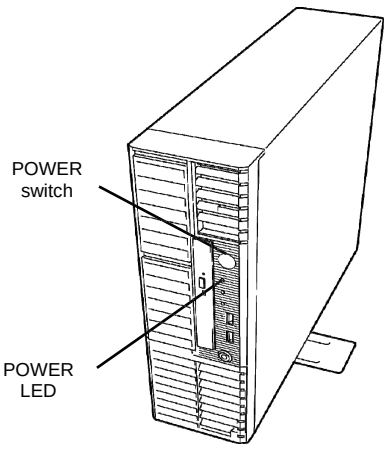
- **When the power cord is connected, the POWER LED lights amber during initialization of the system. You must power on the server after making sure that the amber POWER LED is unlit.**
- **Wait for approximately 10 seconds before turning on the server again after the power has been turned off.**

1. Disconnect Flash FDD if applicable.
2. Turn on the peripheral devices that connect to the display monitor and the server.

Note

If the power cord is connected to power control system such as an Uninterruptible Power Supply (UPS), make sure that the power control system is turned on.

3. Press the POWER switch at the front of the server. The POWER LED is turned on green and after a while, the NEC logo appears on the display. While the NEC logo is being displayed, the self-diagnostic program (POST) runs and diagnoses the hardware. For details, refer to *Chapter 3* (*1.1 POST*).



1.1 POST

POST (Power-On Self-Test) is a self-diagnostic program stored in the server as standard. POST automatically runs immediately after the server is turned on and checks the motherboard, memory, processor (CPU), keyboard, and mouse. POST also displays the start-up messages of different utilities during the operation.

Usually, you do not need to check the contents of POST. However, check messages displayed at POST in the following cases.

- When introducing a server
- If you suspect a failure
- When you hear beep many times during the time between Power ON and OS startup
- When any error message is displayed

1.1.1 POST sequence

Explains how POST runs in order.

Important

- **Do not make key entries or perform mouse operations while POST is in progress.**
- **Some system configurations may display the message "Press Any Key" to prompt a key entry. This message is driven by BIOS of an installed optional board. Make sure to read the manual that comes with the optional board before any key entry.**
- **Powering on the server, after you installed or removed an optional PCI board or moved it to another slot, may display the message that indicates incorrect board configuration and suspend POST.**
  In such a case, press F1 to continue POST. Board configuration can be made using the utility described later.

1. When the server is turned on, POST runs.
   POST starts memory check. When the memory check is completed, some messages appear.
   As factory settings, the NEC logo appears on the screen during POST.
2. When **Password On Boot** is set to **Enabled** on the **Security** menu in the BIOS setup utility (SETUP), the logo is displayed, and then the password entry screen is displayed. If you enter the wrong password three times in a row, POST will stop and you cannot proceed to the subsequent operation. In this case, turn off and on the server.

Important

Do not set a password until you install the OS.

3. If the <Esc> key is pressed, the logo disappears and the details of POST are displayed.

Tips

You can set it to show the details of POST to be displayed from **BIOS** menu without requiring the <ESC> key to be pressed. From the System BIOS Setup, set **Quiet Boot** to **Disabled** in the **Boot** menu.

4. POST displays several types of message. These messages let you know that the installed CPU or connected keyboard and mouse are detected.

Tips

Depending on the installed PCI card configuration, the memory capacity might be displayed less than actually installed physical memory. (This applies to the display of BIOS Setup utility or OS system information.)

5. After a while, the following message is displayed on the screen.

   ```
   Press <F2> SETUP, <F3> Internal Flash Memory, <F4> ROM Utility, <F12> Network
   ```

   By pressing the designated function key following messages, you can call the functions below upon completion of POST.

   <F2> key: Run the SETUP. For information on the SETUP, refer to *Chapter 3 (2. System BIOS Setup)*.
   <F3> key: Run EXPRESSBUILDER from Internal Flash Memory (optional). For information on EXPRESSBUILDER, refer to *Chapter 3 (4. EXPRESSBUILDER)*.
   <F4> key: Run the offline tool. For information on the offline tool, refer to *Chapter 1 Maintenance (9. Offline Tools) in "Maintenance Guide*".
   <F12> key: Boot from network.

   Note

   - If the optional Internal Flash Memory is not installed in the system, the <F3> key message will not be displayed.
   - The <F3> key must be pressed within 5 seconds of the message being displayed.
   - Note that the server will not boot from the Internal Flash Memory even if it is specified to do so by pressing the <F3> key, as long as a bootable CD/DVD-ROM is set on the drive with the boot priority of CD/DVD-ROM is set to higher than Hard Drive.

6. If a controller which has its dedicated BIOS such as a SAS controller board is installed, a message that prompts you to start the dedicated utility to set each board is displayed.

   Example: If an optional SAS Controller is installed

   ```
   Press Ctrl-C to start LSI Corp Configuration Utility…
   ```

   The utility starts by pressing the <Ctrl> + <C> keys.

   Example: If an optional RAID Controller is installed

   ```
   Press <Ctrl> <H> for Web BIOS
   ```

   The utility starts by pressing the <Ctrl> + <H> keys.

   Example: If the jumper setting for an on-board RAID Controller is enabled

   ```
   Press <Ctrl> <M> to Run LSI Software RAID Configuration Utility
   ```

   The utility starts by pressing the <Ctrl> + <M> keys.

   For details on the utility, refer to the manual supplied with each optional board.

   Depending on the configuration, the message "Press Any Key" might appear to prompt a key entry. This is a behavior of the BIOS of the optional board. Continue to operate after checking the manual of the optional board.

7. If you set a password at **SETUP** in the BIOS Setup utility, the password entry screen appears upon successful completion of POST.
   Up to three password entries will be accepted. Three incorrect password entries disable the server to boot. In such a case, turn off the power and wait about ten seconds before turning on to boot the server.

   Important **Do not set a password before OS is installed.**

8. The OS starts when POST is completed.

1.1.2 POST Error Messages

When POST detects an error, it displays an error message on the screen or beeps for some errors. For descriptions of error messages, causes, and countermeasures, refer to "*Maintenance Guide*".

Note Take notes on the messages displayed before consulting with your maintenance service company. Alarm messages are useful information for maintenance.

2. System BIOS Setup

This section describes how to configure Basic Input Output System (BIOS).

Before you install the server and add or remove optional devices, make sure you have read and understood this section to configure properly.

2.1 Overview

SETUP is a utility to do basic hardware settings. This utility is pre-installed in the Internal Flash Memory in the server as standard and can be run without requiring a media for boot.

In most of cases, the SETUP was configured for optimal performance before the server was shipped to you. Therefore, in most of cases, you should not need to use the SETUP utility. **Use only when the case applies to any of cases described in *Chapter 3 (2.4 Cases that Require Setting Changes*).**

2.2 Starting SETUP Utility

Run POST following *Chapter 3 (1.1.1 POST sequence)*.

After a while, the following message will be displayed on the lower left of the screen.

```
Press <F2> SETUP, <F3> Internal Flash Memory, <F4> ROM Utility, <F12> Network
```

If you press the <F2> key at this time, SETUP runs and displays the **Main** menu upon completion of POST. (You can also press the <F2> key while the NEC logo appears to display the **Main** menu.)

Important **If a password is set, you will be prompted to enter the password at the next startup of the SETUP utility. (The timing at which the prompt appears depends on the setting of the password.)**
Up to three password entry attempts are possible. If you enter a wrong password three times in a row, the system stops (you can no longer proceed.) In this case, turn off and on the server.

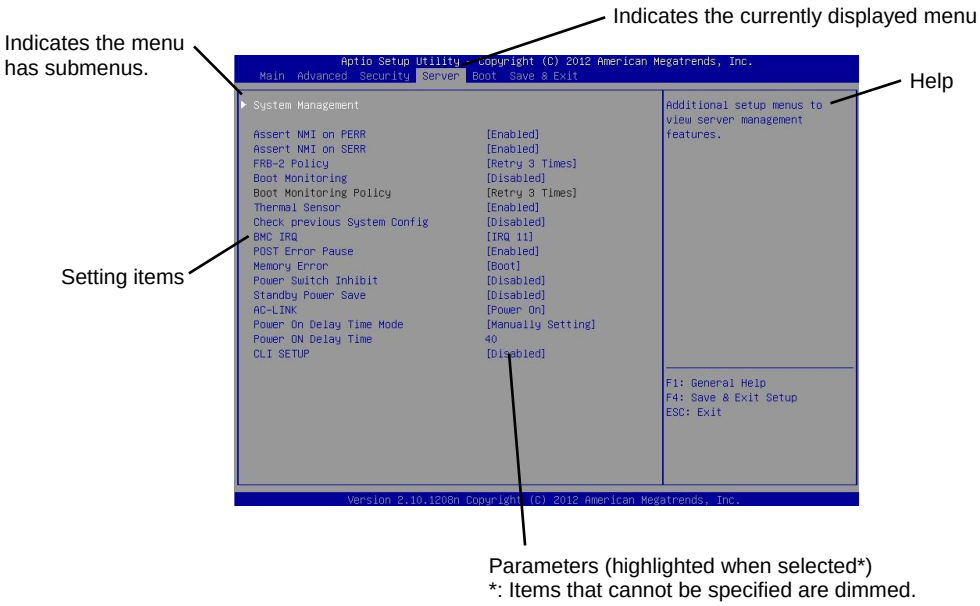
To exit the SETUP utility after saving the parameters, select **Save & Exit** and then **Save Changes and Exit**.

To exit the SETUP utility without saving the parameters, select **Save & Exit** and then **Discard Changes and Exit**.

Important To restore the default values, select **Save & Exit** and then **Load Setup Defaults**. (The default values might differ from the factory settings.)

2.3 Description on On-Screen Items and Key Usage

This section shows display examples and how to control the key. Use the keyboard to work with the SETUP utility.


Indicates the currently displayed menu
Indicates the menu has submenus.
Help
Setting items
Parameters (highlighted when selected*)
*: Items that cannot be specified are dimmed.
Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Main Advanced Security Server Boot Save & Exit
System Management
Assert NMI on PERR [Enabled]
Assert NMI on SERR [Enabled]
FRB-2 Policy [Retry 3 Times]
Boot Monitoring [Disabled]
Boot Monitoring Policy [Retry 3 Times]
Thermal Sensor [Enabled]
Check previous System Config [Disabled]
BMC IRQ [IRQ 11]
POST Error Pause [Enabled]
Memory Error [Boot]
Power Switch Inhibit [Disabled]
Standby Power Save [Disabled]
AC-LINK [Power On]
Power On Delay Time Mode [Manually Setting]
Power ON Delay Time 40
CLI SETUP [Disabled]
Additional setup menus to view server management features.
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.10.1208n Copyright (C) 2012 American Megatrends, Inc.

☐ Cursor keys (<↑>, <↓>)
Select an item displayed on the screen. If characters of an item are highlighted, that means the item is currently selected.

☐ Cursor keys (<←>, <→>)
Select menus including **Main**, **Advanced**, **Security**, **Server**, **Boot**, and **Save & Exit**.

☐ <–> key/<+> key
Change the value (parameter) of the selected item. You cannot use this key when a menu which has ▶ on the left is selected.

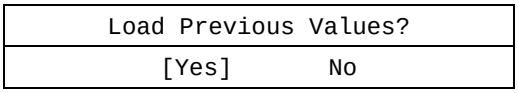
☐ <Enter> key
Press this key to confirm the selected parameter.

☐ <Esc> key
Pressing this key takes you to the previous screen. If you keep pressing the key, the following window is displayed. If you select **Yes**, the SETUP closes without saving the changed parameters.

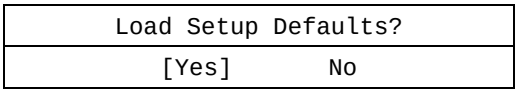
Quit without saving?
[Yes] No

☐ <F1> key
Press this key to display help information. If you need help using the SETUP, press this key. Press the <Esc> key to go back to the original screen.

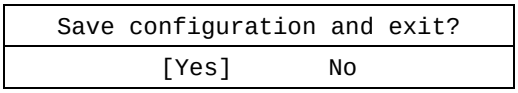
- <F2> key
  If you press this key, the following window appears. If you select **Yes**, the previous parameter(s) are restored.



- <F3> key
  If you press this key, the following window appears. If you select **Yes**, restore the parameters of the currently selected item to the default setting. (**This might be different from the parameters configured before shipment.**)



- <F4> key
  If you press this key, the following window appears. If you select **Yes**, the parameter you configured is saved and SETUP closes.



2.4 Cases that Require Setting Changes

If you change the BIOS settings shown below, use the SETUP utility to change a parameter which was configured as factory setting. A list of SETUP parameters and factory settings are described in ***Chapter 2 (1. Details of System BIOS)*** **in "*Maintenance Guide*".**

Category	Description	To be changed	Remark
Basic	Change date and time	**Main → System Date** **Main → System Time**	Configurable on OS
	On/Off NumLock on power ON	**Boot → Bootup Numlock State**	
	On/Off the function to display the NEC logo during POST	**Boot → Quite Boot → Disabled**	By pressing the <Esc> key, prevent the display of the logo.
Optional board	When an optional board is installed, set to [Disabled] for Option ROM for all PCI devices except for the boot device.	**Advanced → PCI Configuration → PCI Device Controller and Option ROM Settings → PCI Slot n Option ROM → Enabled**	*n* is PCI slot number of the RAID Controller
		Advanced → PCI Configuration → PCI Device Controller and Option ROM Settings → LAN1 Option ROM Scan → Disabled	Option ROM on LAN1 must be disabled.
Memory	Configure the memory after the DIMM is added or exchanged.	**Advanced → Memory Configuration → Memory Retest → Yes**	After rebooting, the **Memory Retest** setting changes to **No** automatically.
Boot	Change the boot order of devices	**Boot → Boot Option Priorities →** Change the boot priority	
	Use remote power on function (from modem)	**Advanced → Advanced Chipset Configuration → Wake On Ring → Enabled**	
	Use remote power on function (from RTC alarm)	**Advanced → Advanced Chipset Configuration → Wake On RTC Alarm → Enabled**	
	Control from HW console terminal	**Advanced → Serial Port Configuration →** Change respective setting.	
Security	Set a password to restrict operation of the SETUP utility.	**Security → Administrator Password → Security → User password**	After a password is set, a message prompting you to enter the password is displayed when the SETUP utility is launched next time.
	Set a password to restrict booting.	**Security → Password on Boot → Enabled**	You can select this parameter after you set a password.

Category	Description	To be changed	Remark
UPS Powerlink	When the server is supplied with power from UPS, always turn on the power.	**Server → Power Control Configuration → AC-LINK → Power On**	
	If it is turned off by using POWER switch, leave it OFF even when UPS supplies power.	**Server → Power Control Configuration → AC-LINK → Last State**	
	Keep the power OFF even when UPS supplies power.	**Server → Power Control Configuration → AC-LINK → Stay off**	

Password

If you have set a password, a message prompt you to enter password will be displayed from the next time.

```
Enter password [                ]
```

You can attempt password entry up to 3 times. **If you entered a wrong password 3 times, operation stops.** (You cannot operate further.) Turn off the power.

Saving changes

If you finish configuration, select **Save & Exit** and then **Save Changes and Exit** to save changes and exit.

If you wish to exit without saving the changed parameters, select **Save & Exit** and then **Discard Changes and Exit**.

Or if you wish to restore the setting to default values, select **Save & Exit** and then **Load Setup Defaults**.

(**The default value might be different from the factory setting.**)

3. EXPRESSSCOPE ENGINE 3

3.1 Overview

EXPRESSSCOPE Engine 3 provides a variety of features using BMC (Baseboard Management Controller), which is a system management LSI.

EXPRESSSCOPE Engine 3 monitors the power unit, fans, temperature, and voltage of the server. If you have the management LAN connector connected to the network, you can remotely perform the following over a web browser or SSH client:

- Manage the server
- Remotely control the keyboard, video, and mouse (KVM)*
- Remotely access a CD/DVD/floppy disk/ISO image/USB memory*.

***** To use this feature, the optional license for remote management (N8115-04) is required.
To enable this feature, a USB mass storage device (Remote FD, Remote CD/DVD, Remote USB Memory, or Virtual Flash) is virtually connected.
If the server runs on Windows Server 2008 R2, this feature does not support the video resolution of 1280 x 1024 (at 60 Hz, 32-bit).

Note

(If N8115-04 Remove KVM and Media License if installed)

More than one removable drives other than the actual drive are displayed on the operating system of the host system. This is a normal operation and these added removable drives are the virtual removable drives reserved for the remote media function of EXPRESSSCOPE Engine 3 (*1).

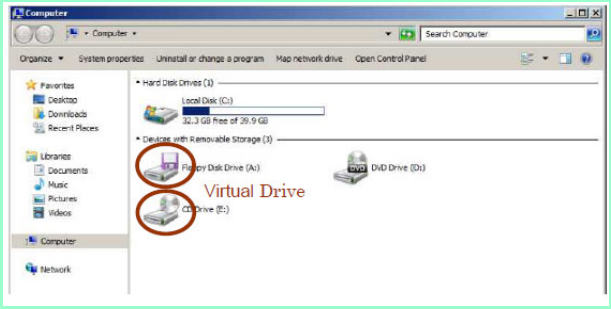


Fig. 1 Exp. Windows Server 2008 R2 Computer Folder (*2)

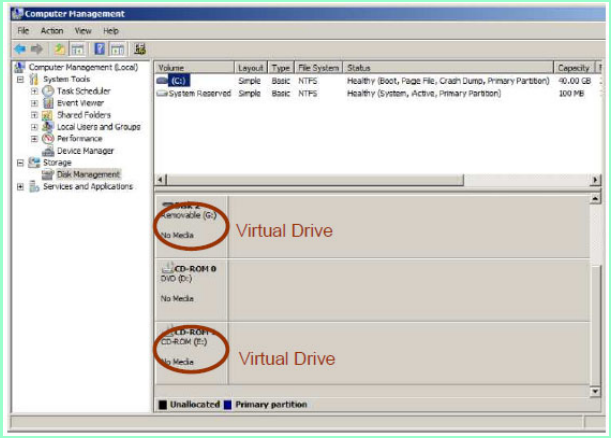


Fig. 2 Exp. Windows Server 2008 R2 Server Manager (*2)

*1 A function to use FD/CD/DVD drives, ISO images and USB memories connected to the management PC as drives virtually connected to the host system.

*2 The number of drives and the drive character are different depending on system configurations.

3.2 EXPRESSSCOPE ENGINE 3 Network configuration

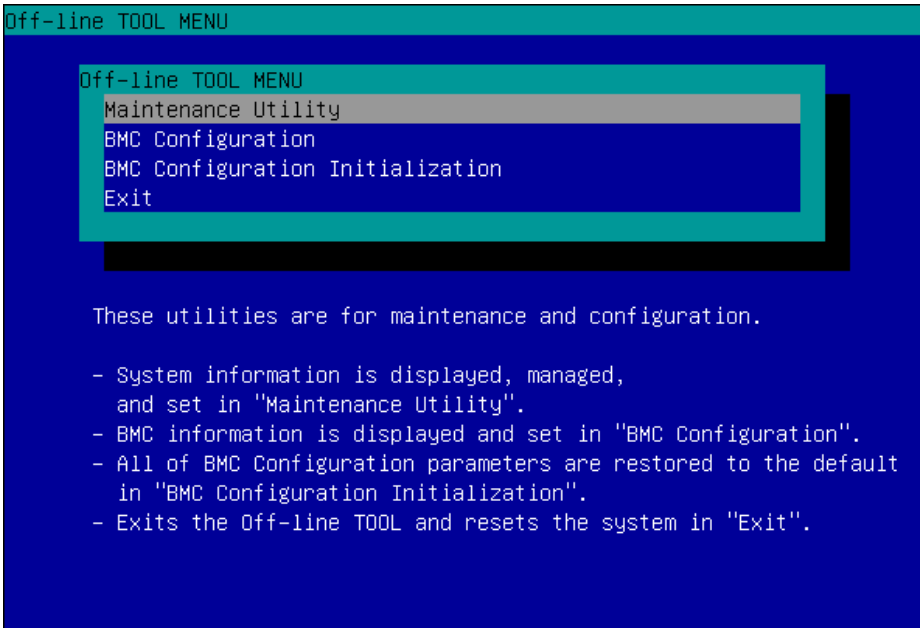
To enable EXPRESSSCOPE Engine 3 to be used via network, network configuration is required.

The following procedure describes how to enable the use of the engine on web browsers.

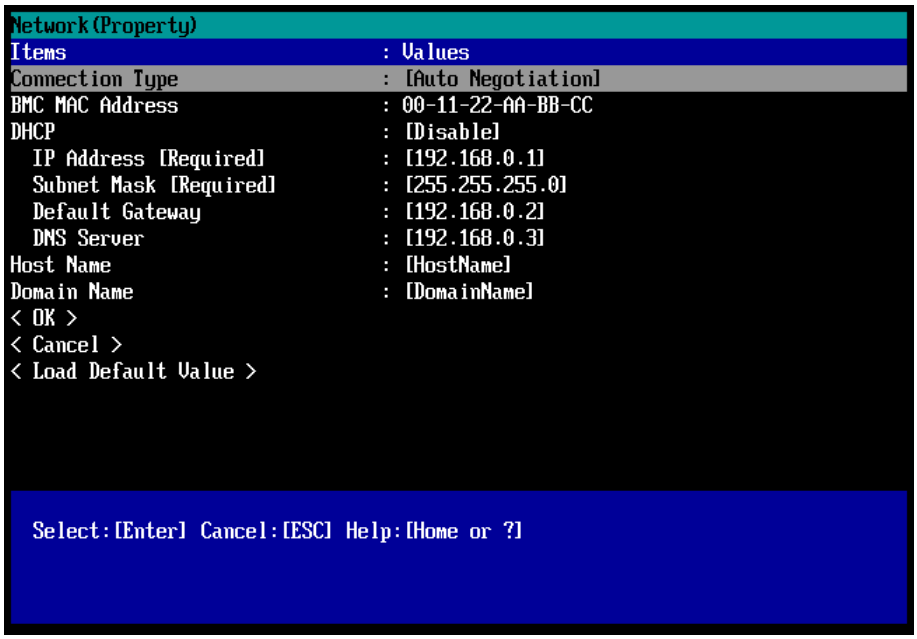
1. Run POST following *Chapter 3 (1.1.1 POST sequence)*. Wait until the following message appears on the lower left of the screen.

   `Press <F2> SETUP, <F3> Internal Flash Memory, <F4> ROM Utility, <F12> Network`

2. If you press the <F4> key at this time, ROM utility starts upon completion of POST. You can also press the <F4> key while the NEC logo is being displayed to open the Off-line TOOL MENU screen.
3. The keyboard selection screen appears. Select your keyboard type.
   After that, the Off-line TOOL MENU screen appears. On this screen, specify the network settings for EXPRESSSCOPE Engine 3.
4. When the Off-line TOOL MENU appears, select **BMC Configuration**, **BMC Configuration**, **Network**, and then **Property**.


Off-line TOOL MENU
Off-line TOOL MENU
Maintenance Utility
BMC Configuration
BMC Configuration Initialization
Exit
These utilities are for maintenance and configuration.
- System information is displayed, managed,
and set in "Maintenance Utility".
- BMC information is displayed and set in "BMC Configuration".
- All of BMC Configuration parameters are restored to the default
in "BMC Configuration Initialization".
- Exits the Off-line TOOL and resets the system in "Exit".

5. If **Property** is selected, the following screen is displayed. On this screen, specify whether to use DHCP and if DHCP is not used, configure IP Address/Subnet Mask.


Network(Property)
Items : Values
Connection Type : [Auto Negotiation]
BMC MAC Address : 00-11-22-AA-BB-CC
DHCP : [Disable]
IP Address [Required] : [192.168.0.1]
Subnet Mask [Required] : [255.255.255.0]
Default Gateway : [192.168.0.2]
DNS Server : [192.168.0.3]
Host Name : [HostName]
Domain Name : [DomainName]
< OK >
< Cancel >
< Load Default Value >
Select:[Enter] Cancel:[ESC] Help:[Home or ?]

Tips

If **Shared BMC LAN** is enabled, Web feature, remote media/KVM feature, or command line interface feature may be interrupted. In this case, wait for a while, and connect with network again.

6. Connect the LAN cable to the management LAN connector in order to connect to the network. It will be available for use if you access EXPRESSSCOPE Engine 3 via Web browser from PC for management according to the setting.

4. EXPRESSBUILDER

EXPRESSBUILDER helps you to install Windows or maintain the server.

4.1 Features of EXPRESSBUILDER

EXPRESSBUILDER provides the following features.

Features	Descriptions
Setup (Windows reinstallation)	Installs Windows on your server. Easily completes the process from RAID configuration to installation of applications. To use this feature, select **Os installation** in the menu after boot.
Storage of software*	Stores various bundled software (such as NEC ESMPRO Agent).
Maintenance	Diagnoses your server system. To use this feature, select **Tool menu** in the menu after boot.
Storage of documents*	Stores various documents (including "*User's Guide*", "*Installation Guide*" and "*Maintenance Guide*").

*Documents and some software components are not stored in N8115-05 Internal Flash Memory (option).

4.2 Starting EXPRESSBUILDER

If you want to install Windows, start EXPRESSBUILDER by using any of the following.

EXPRESSBUILDER DVD:

Set the DVD on the drive and either turn on the server or restart the server by pressing <Ctrl> + <Alt> + <Delete>. EXPRESSBUILDER is booted from DVD.

If you want to install any bundled software or see documents, set the DVD to a computer running Windows. The Autorun menu appears automatically.

N8115-05 Internal Flash Memory (option):

During POST, press <F3>. If you start with this option, **make sure that the media was removed from the drive.**

5. Installing Software Components

Continue to install software components such as OS.

Refer to the instructions below.

- Installation Guide (Windows)

6. Turning off the Server

Turn off the server by using the following procedure. If the power cord of the server is connected to a UPS, refer to the documentation supplied with the UPS or the documentation for the application controlling the UPS.

1. Shut down the OS.
2. If the server does not automatically power off, press the POWER switch at the front of the server. Confirm that POWER LED is OFF.
3. Turn off peripheral devices.

NEC Express5800 Series
Express5800/T110f-S

4 Appendix

1. **Specifications**

2. **Interrupt Lines**

I. Specifications

I.I Air Cooling System

Product name		Express5800/T110f-S, EXP285A		
		N8100-1983F		
CPU	Type	Intel® Xeon® processor E3-1220 v3	Intel® Xeon® processor E3-1230L v3	Intel® Xeon® processor E3-1265L v3
	Clock/cache	3.10 GHz/8 MB	1.80 GHz/8 MB	2.50 GHz/8 MB
	Standard / (maximum)	Not pre-installed / (1)		
Chipset		Intel® C224 Chipset		
Memory	Standard	Not pre-installed		
	Maximum	32 GB (8 GB x 4)		
	Expansion unit	DDR3L-1600 SDRAM DIMM (unbuffered) x 1		
	Memory module	ECC DDR3L-1600 SD-RAM DIMM with 2Way Interleave support		
Graphics		Integrated in BMC (more than 32 MB)		
Auxiliary storage	Hard Disk Drive (standard)	Not pre-installed		
	Hard Disk Drive (maximum)	3.5-inch HDD cage (N8154-65F) installed: 8 TB (2 x 4 TB) 2.5-inch HDD cage (N8154-59F/-56F*1) installed: SATA 6 TB (6 x 1 TB), SAS 7.2 TB (6 x 1.2 TB), SAS SSD 2.4 TB (6 x 400 GB) 3.5-inch/2.5-inch HDD cage (N8154-65F/-56F*1) installed: SATA 10 TB (2 x 4 TB + 2 x 1 TB), SATA+SAS 10.4 TB (2 x 4 TB SATA + 2 x 1.2 TB SAS)		
	RAID	SATA 6 Gb/s : RAID 0/1/10(standard)*1, RAID 5/6/50/60 (optional) SAS 6 Gb/s : RAID 0/1/5/6/10/50/60 (optional)		
	Optical disk drive	Selectable: DVD-ROM drive or DVD SuperMULTI drive		
Expansion bay	Disk bay	3.5-inch Hard Disk Drive x 2 + 2.5-inch Hard Disk Drive x 2 (optional) 2.5-inch Hard Disk Drive x 4 + 2.5-inch Hard Disk Drive x 2 (optional)		
	Backup device	1 slot		
Expansion slot (PCI)		1x PCI Express 3.0 (x16 lane, x16 socket) 1x PCI Express 2.0 (x4 lane, x8 socket) 2x PCI Express 2.0 (x1 lane, x8 socket)		
External interface	USB3.0	Front: 1 port; rear: 2 ports; internal: 1 port		
	USB2.0	Front: 1 port; rear: 2 ports; internal: 1 port		
	Serial	1 port (D-sub 9-pin)*2		
	Network	2-port 1000Base-T, 100Base-TS/10Base-T (RJ-45) Management LAN connector (RJ-45)		
	Display	MINI D-sub 15-pin (1 port)		
External dimensions		98.0 mm (width) x 386.5 mm (depth) x 341.0 mm (height) (not including vent holes cover, stabilizer, protrusions) 200.0 mm (width) x 393.7 mm (depth) x 347.1 mm (height) (vent holes cover, stabilizer, protrusions included)		
Mass (maximum)		8 kg (11 kg)		
Power supply		1 x 250 W 80 PLUS® Platinum (bipolar grounded outlet) (hot-plug not available) 100/200 VAC ± 10%, 50/60 Hz ± 3 Hz		
Power rating		380 W		
Environmental conditions	When running	Temperature: 10 to 40°C; Humidity: 20 to 80% (and no condensation)		
	When in storage	Temperature: −10 to 55°C; Humidity: 20 to 80% (and no condensation)		
Bundled OS		None		
Supported OSs		Microsoft® Windows Server® 2008 Standard (RTM, SP2 or later) Microsoft® Windows Server® 2008 Enterprise (RTM, SP2 or later) Microsoft® Windows Server® 2008 R2 Standard Microsoft® Windows Server® 2008 R2 Enterprise Microsoft® Windows Server® 2012 Standard Microsoft® Windows Server® 2012 Datacenter Red Hat® Enterprise Linux® 5.9 or later Red Hat® Enterprise Linux® 5.9 or later (EM64T) Red Hat® Enterprise Linux® 6.4 or later Red Hat® Enterprise Linux® 6.4 or later (x86_64) VMware ESXi™ 5.1 update 1		
Included parts		104 keyboard, two-button mouse with scroll wheel, rubber feet, EXPRESSBUILDER DVD, Getting Started, screws for device, Power code		

*1 For Linux OS, onboard RAID feature is not supported.
*2 Can be optionally expanded to two ports.

1.2 Liquid Cooling System

Product name		Express5800/T110f-S, EXP285A		
		N8100-1984F		
CPU	Type	Intel® Xeon® processor E3-1220 v3	Intel® Xeon® processor E3-1230L v3	Intel® Xeon® processor E3-1265L v3
	Clock/cache	3.10 GHz/8 MB	1.80 GHz/8 MB	2.50 GHz/8 MB
	Standard / (maximum)	Not pre-installed / (1)		
Chipset		Intel® C224 Chipset		
Memory	Standard	Not pre-installed		
	Maximum	32 GB (8 GB x 4)		
	Expansion unit	DDR3L-1600 SDRAM DIMM (unbuffered) x 1		
	Memory module	ECC DDR3L-1600 SD-RAM DIMM with 2Way Interleave support		
Graphics		Integrated in BMC (more than 32 MB)		
Auxiliary storage	Hard Disk Drive (standard)	Not pre-installed		
	Hard Disk Drive (maximum)	3.5-inch HDD cage (N8154-65F) installed: 8 TB (2 x 4 TB) 2.5-inch HDD cage (N8154-59F/-56F*1) installed: SATA 6 TB (6 x 1 TB), SAS 7.2 TB (6 x 1.2 TB), SAS SSD 2.4 TB (6 x 400 GB) 3.5-inch/2.5-inch HDD cage (N8154-65F/-56F*1) installed: SATA 10 TB (2 x 4 TB + 2x 1 TB), SATA+SAS 10.4 TB (2 x 4 TB SATA + 2 x 1.2 TB SAS)		
	RAID	SATA 6 Gb/s : RAID 0/1/10(standard)*1, RAID 5/6/50/60 (optional) SAS 6 Gb/s : RAID 0/1/5/6/10/50/60 (optional)		
	Optical disk drive	Selectable: DVD-ROM drive or DVD SuperMULTI drive		
Expansion bay	Disk bay	3.5-inch Hard Disk Drive x 2 + 2.5-inch Hard Disk Drive x 2 (optional) 2.5-inch Hard Disk Drive x 4 + 2.5-inch Hard Disk Drive x 2 (optional)		
	Backup device	1 slot (used exclusively with 2.5-inch HDD cage (N8154-56F))		
Expansion slot (PCI)		1x PCI Express 3.0 (x16 lane, x16 socket) 1x PCI Express 2.0 (x4 lane, x8 socket) 2x PCI Express 2.0 (x1 lane, x8 socket)		
External interface	USB3.0	Front: 1 port; rear: 2 ports; internal: 1 port		
	USB2.0	Front: 1 port; rear: 2 ports; internal: 1 port		
	Serial	1 port (D-sub 9-pin)*2		
	Network	2-port 1000Base-T, 100Base-TS/10Base-T (RJ-45) Management LAN connector (RJ-45)		
	Display	MINI D-sub 15-pin (1 port)		
External dimensions		98.0 mm (width) x 386.5 mm (depth) x 341.0 mm (height) (not including vent holes cover, stabilizer, protrusions) 200.0 mm (width) x 393.7 mm (depth) x 347.1 mm (height) (vent holes cover, stabilizer, protrusions included)		
Mass (maximum)		8 kg (11 kg)		
Power supply		1x 250 W 80 PLUS® Platinum (bipolar grounded outlet) (hot-plug not available) 100/200 VAC ± 10%, 50/60 Hz ± 3 Hz		
Power rating		380 W		
Environmental conditions	When running	Temperature: 10 to 40°C; Humidity: 20 to 80% (and no condensation)		
	When in storage	Temperature: −10 to 55°C; Humidity: 20 to 80% (and no condensation)		
Bundled OS		None		
Supported OSs		Microsoft® Windows Server® 2008 Standard (RTM, SP2 or later) Microsoft® Windows Server® 2008 Enterprise (RTM, SP2 or later) Microsoft® Windows Server® 2008 R2 Standard Microsoft® Windows Server® 2008 R2 Enterprise Microsoft® Windows Server® 2012 Standard Microsoft® Windows Server® 2012 Datacenter Red Hat® Enterprise Linux® 5.9 or later Red Hat® Enterprise Linux® 5.9 or later (EM64T) Red Hat® Enterprise Linux® 6.4 or later Red Hat® Enterprise Linux® 6.4 or later (x86_64) VMware ESXi™ 5.1 update 1		
Included parts		104 keyboard, two-button mouse with scroll wheel, rubber feet, EXPRESSBUILDER DVD, Getting Started, screws for device, Power code		

*1 For Linux OS, onboard RAID feature is not supported.
*2 Can be optionally expanded to two ports.

2. Interrupt Lines

Interrupt lines are assigned as factory settings as shown below. Use this table as a reference when you add optional devices.

- **Interrupt lines**
  As factory settings, interrupt lines are assigned as follows.

IRQ	Peripheral Device (Controller)	IRQ	Peripheral Device (Controller)
0	System timer	8	Real-time clock
1	–	9	Microsoft ACPI-Compliant System
2	Cascade connection	10	PCI
3	COM 2 serial port	11	PCI
4	COM 1 serial port	12	–
5	PCI	13	Arithmetic operation processor
6	–	14	–
7	–	15	–